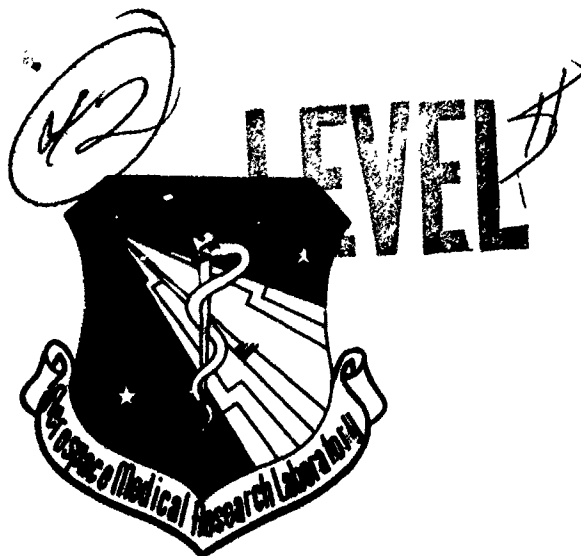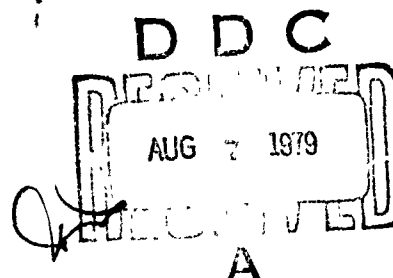AMRL-TR-79-33

DESIGN CRITERIA FOR CHARACTERIZING INDIVIDUALS IN THE EXTREME UPPER AND LOWER BODY SIZE RANGES

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June 1979

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AEROSPACE MEDICAL RESEARCH LABORATORY
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AIR FORCE SYSTEMS COMMAND
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NOTICES

TECHNICAL REVIEW AND APPROVAL

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This report has been reviewed by the Information Office (OI) and is releasable to the National Technical Information Service (NTIS). At NTIS, it will be available to the general public, including foreign nations.

This technical report has been reviewed and is approved for publication.

FOR THE COMMANDER

CHARLES BATES, JR.
Chief
Human Engineering Division
Aerospace Medical Research Laboratory

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Designers commonly attempt to represent a range of human body sizes by using human manikins, three-dimensional forms, computer simulations, and various other models. These analogues are developed from a limited number of body size groupings, often utilizing 5th, 50th, or 95th percentile values. There are serious limitations to this percentile approach, exemplified by the fact that at the ends of the distribution, percentile values are not additive. Focusing on the ends of the distribution, where limitations are most intense, this report pinpoints and illustrates problems associated with

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20. ABSTRACT (cont'd)

the use of percentile values, and describes two alternative approaches:
subgroup and regression values. Either of these alternatives offers sig-
nificant improvement over the percentile approach and can be used to
characterize any portion of the body size distribution. Regression equa-
tions for predicting dimensions from weight and stature and from weight and
sitting height are provided to aid designers in computing dimensional body
size data needed for cockpit and other work station layouts.

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Section I

INTRODUCTION

Since World War II, workspaces and equipment have been designed
with a view toward accommodating as wide a range of individuals as
possible who will ultimately occupy and operate them. As changing
times broaden occupational opportunities for women, youth and older
persons, they challenge the inventiveness of designers of aircraft,
automobiles, weapons, and a vast array of other equipment and
clothing, which are increasingly used by more diverse populations.

While there is, as yet, no practical way of insuring accommo-
dation for 100% of a heterogeneous user population, it is common
practice to seek a design solution for 90 to 95% of a target group,
a task which demands some means of consolidating large quantities
of body size data into a reasonable number of manageable groupings.
Among the many design aids used in the development of clothing,
equipment and work stations are various forms of human analogues
ranging from two-dimensional templates to detailed three-dimensional
anthropometric dummies. Usually these analogues are developed from
three groups of data--5th, 50th and 95th percentile body size data,
with the 5th and 95th percentile models designed to represent the
smallest and largest segments of the population.

It has been amply demonstrated (Daniels, 1952; McConville and
Churchill, 1976) that while the concept of "average" is valuable as
an estimate of central tendency, and, in conjunction with some
measure of variability such as the standard deviation, useful as
a descriptive tool, the 50th percentile or "average" person is a
rare bird indeed, based as it is on the erroneous assumption that
an "average"-sized individual will be average in all dimensions.
Furthermore, McConville and Churchill pointed out that the limi-
tations which apply to the "average" man are, if anything, intensi-
fied in dealing with 5th and 95th percentile forms. Not only are
the percentile forms unrealized in nature, but they are also sta-
tistically impossible since 5th or 95th percentile values are
not additive. As will be demonstrated in this study, the sum of
related percentile parts creates a total considerably at variance
with the actual total. Thus, in order to develop an analogue from
these values, many of them must be altered and the resulting models
are often both unrealistic and unreliable.

Two alternative approaches were described by McConville and
Churchill. The subgroup method and the regression method, they
suggested, are preferable for most design purposes. In this report
we will expand on their study by demonstrating in some detail that
the methods recommended by McConville and Churchill are considerably
more reliable in producing realistic design values to characterize
persons at the extreme ends of the population distribution than are
the more commonly used techniques based on percentile values.

The subgroup method is an approach with which subsets, based on the variables of stature and weight, are drawn from the sample at each end of the distribution. The resulting "small-shorts" consist of all the individuals whose stature and weight fall below the 10th percentile and the "large-longs" consist of all the individuals whose stature and weight are above the 90th percentile. Examples of such groups are identified in the bivariate distribution tables shown in Figures 1 and 2. The use of variable means of these subgroups as the design values will be shown to be a better approach for characterizing persons at the extremities of the body size range than the percentile method, although caution must be exercised since the smaller the sample the more likely it is that an aberrantly proportioned individual will unduly affect a given design value.

The procedure recommended as being most useful for design purposes is the regression method in which multiple regression equations are used to predict each variable from given values of stature and weight. This method results in values on which to base models representing the tails of the distribution which are comparable to percentile values but considerably more realistic and reliable. The advantages of this method over the subgroup method are connected with sample size and with the capability of regression equations to predict an array of variables at any given values of stature and weight, features which are discussed in more detail in the concluding section of this report.

The analysis in the previous study was based on the 1967 and 1968 surveys of U.S. Air Force men and women, respectively (Churchill et al., 1977a and 1978; Clauser et al., 1972). The total male sample contains 2420 individuals and the female sample 1905. The extreme end subsets, of course, contain far fewer persons--61 men and 59 women in the small subset and 90 men and 66 women in the large subset. Therefore, in order to validate the findings of the McConville and Churchill study, we expanded the data base with additional samples.

The source data in this study were from the 1966 Army (White and Churchill, 1971) and the 1967 Air Force male samples, and the 1977 Army (Churchill et al., 1977b) and the 1968 Air Force female samples and are used both individually and in combined forms. The combination of samples increased the number of individuals to 116 female subjects and 320 male subjects in the small subsets and 114 females and 316 males in the large subsets.

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STATURE (cm)

WEIGHT (lb)

SHORT

REGULAR

(LARGE-LONG)

(SMALL-SHORT)

LONG

Figure 1.   1968 WAF stature-weight bivariate distribution.

STATURE (cm)

WEIGHT (lb)

SHORT

REGULAR

(LARGE-LONG)

(SMALL-SHORT)

LONG

Figure 2.   1967 Air Force stature-weight bivariate distribution.

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Section II

COMBINATION OF SAMPLES

Before combined samples can be reliably used, it must be determined that the various dimensions were measured in exactly the same way. Obvious discrepancies can be singled out by reading the measurement descriptions and landmark definitions but other measurement differences are not so easily identified. They may be caused by a number of factors, such as the use of unlike measuring instruments or different measurers who may or may not interpret landmarks in the same way.

If the measurement differences are random, such as might be caused by an occasional careless reading of the measuring instruments, they will not affect the distribution of the data and will not cause concern. A measurement difference consistently biased in the same direction, which could occur as the result of using a faulty instrument, will, however, affect the distribution of the data. A hypothetical example of this bias is illustrated in Figure 3. The samples create two distribution curves which may or may not be similar in shape and size but occupy two different sections of the size scale. This reflects the fact that one sample has larger values, as a whole, than the other. When two samples in which variables were measured differently are combined, the combined distribution may have a larger coefficient of variation, ($\frac{SD}{\bar{x}}$ x 100), than either of the paired samples or the values at the extreme ends of the distribution may be entirely from one of the paired samples at one end and from the other sample at the other end. A third clue to measurement discrepancies is provided by the bimodal distribution of the data, a pattern characterized by two peaks in the curve representing the distribution of values. This configuration is not always easy to identify since a normal distribution curve is never entirely smooth and can exhibit some minor peaks and valleys which do not necessarily denote bimodality. For this reason, a suspected bimodal distribution was treated as supporting evidence for discrepant values but not considered strong enough, alone, to indicate a measurement difference.

We flagged those variables which had a combined sample coefficient of variation which was larger than those of the paired samples by approximately one percent or more.

To detect a lack of integration in the extreme end values of the combined sample, we used the XVAL program (Kikta and Churchill, 1978) which prints out the ten smallest and ten largest values for each variable. We flagged all the variables for which all the ten smallest values were from one of the paired samples and all the ten largest were from the other.

From the female combined sample data the variables which exhibited these characteristics included: head circumference, elbow circumference (flexed), neck circumference, and knee
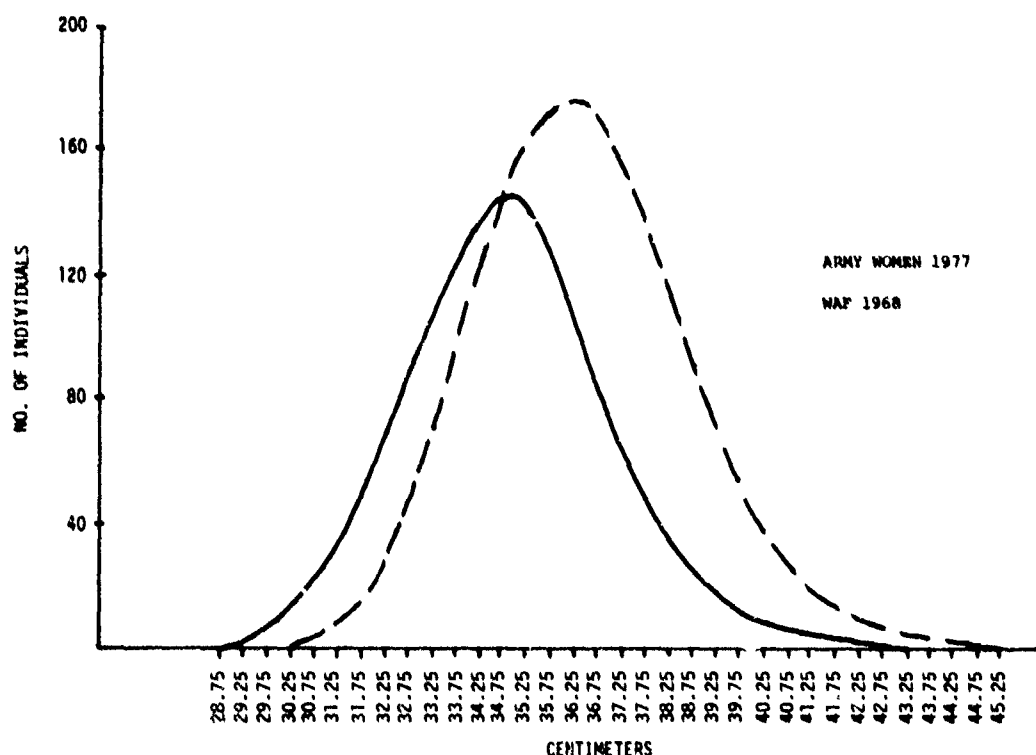
Figure 3. Knee circumference frequency distribution
          curves (female).

circumference.   From the male combined sample data the variables
included: bitragion breadth, hip breadth, and sleeve length.
There are only two variables for which a probable cause is known.
Head circumference may have a measurement difference because there
were a great many more Black persons in the Army sample than the
Air Force sample, many of whom had coarse hair which inhibited
exact measurement.   Neck circumference was discovered to have a
different measurement description to begin with; thus this proce-
dure also served to check measurement differences which had escaped
notice in the original screening. We were unable to determine the
reasons for differences in the other variables but we deemed it
best to include only those variables which were not suspect, so
we discarded all of the above. This left 44 variables for the
female combined sample and 42 variables for the male combined sample.

Section III

PRESENTATION OF DATA
AND GENERAL OBSERVATIONS

Following the procedures outlined in the previous study (McConville and Churchill, 1976), we tabulated the total sample 5th and 95th percentile values, the subgroup mean values, and the regression values (Tables 1 - 12). The values in Tables 1 through 8 are derived from the individual Army and Air Force samples. The values in Tables 9 through 12 are derived from the combined Army and Air Force samples. The 5th percentile values represent the point at which only five percent of the subjects in the sample have smaller values. The 95th percentile values represent the point at which only five percent of the subjects in the sample have larger values.

The subgroups are subsets of an entire sample, in this case based upon the variables of stature and weight. The "small-shorts" consist of those subjects below the 10th percentile for both stature and weight and the "large-longs" consist of those individuals above the 90th percentile for both stature and weight. Once the subgroups of subjects were obtained, the averages (means, X̄) of their dimensions were computed to arrive at values for design purposes, and for comparison with percentile and regression values in this study.

The regression values are arrived at from multiple regression equations which are used to predict values for each variable from stated values of stature and weight. There is a separate multiple regression equation for each anthropometric variable. After the equations are developed, any given values for stature and weight can be plugged into the equation to predict values for each variable which will represent a best estimate of the variable's size at that stature and weight. The stature and weight values used in these regression equations are from either the 5th or 95th percentiles.

The first column in each table lists the variable names. The percentile values are presented in the second column and the subgroup mean values in the third. These are followed by their deviations and their percent deviations (D and %D) in the fourth and fifth columns. The deviation is simply a difference, one value subtracted from another; in this case, the percentile value from the subgroup value. The deviation in percent form is the deviation expressed as a percent of the value from which it was subtracted. For example, the deviation in percent form of X from Y is expressed by the equation

$$\frac{Y-X}{Y} \times 100 = \frac{D}{Y} \times 100 = \%D$$

The sixth column lists the predicted or multiple regression values for each variable, based on the percentile stature and weight

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inputs, followed by the deviations and percent deviations of the percentile values from the regression equation values in columns seven and eight. Columns nine and ten are the deviations and percent deviations of the regression values from the subgroup mean values.

A study of Tables 1 - 8 shows that certain general characteristics consistently occur. First, the "small-short" subgroup's stature and weight mean values are smaller than the 5th percentile values for stature and weight in all samples. At the same time, the "small-short" subgroup mean values for the other variables are, on the average, larger than the 5th percentile values. The complement occurs at the other end of the range. The "large-long" subgroup stature and weight mean values are larger than the 95th percentile values, while the "large-long" subgroup mean values for the other variables are, on the average, smaller than the 95th percentile values.

The deviation from the percentile values is, on the average, greater for the regression values than for the subgroup mean values for all samples. Regression values by their nature tend toward the mean, so in almost all cases the regression values were larger than the 5th percentile and smaller than the 95th percentile.

The combined sample results (Tables 9 - 12) are very similar to the individual sample results. The data display the same characteristics and the differences between the percentile subgroup regression values are of about the same magnitude and sign as they are for the individual samples. This being the case, the combined sample results serve to reinforce the reliability of the individual sample results.

TABLE 1

COMPARISON OF 5TH PERCENTILE VALUES WITH SMALL-SHORT SUBGROUP VALUES AND SMALL SIZE REGRESSION VALUES
1966 SURVEY OF ARMY PERSONNEL *

WEIGHT IN KILOGRAMS ALL OTHER MEASURMENT VALUES IN CENTIMETERS

VARIABLE NAME	5TH PERCENTILE	SMALL SHORT MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 5TH XILE D	%D	REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 5TH XILE D	%D	DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE D	%D
WEIGHT	57.00	55.44	-1.56	-2.82	57.00	0.00	0.00	-1.56	-2.82
STATURE	163.76	161.96	-1.80	-1.11	163.76	3.90	0.00	-1.80	-1.11
CERVICALE HEIGHT	139.27	137.79	-1.48	-1.09	139.60	.33	.24	-1.82	-1.32
SHOULDER HEIGHT	133.55	132.30	-1.25	-.95	133.88	.33	.24	-1.58	-1.19
WAIST HEIGHT	97.39	97.96	.57	.58	99.08	1.69	1.70	-1.12	-1.14
FUNCTIONAL REACH	74.84	77.00	2.16	2.80	77.68	2.84	3.66	-.69	-.89
CROTCH HEIGHT	76.23	77.50	1.27	1.64	78.36	2.13	2.72	-.86	-1.11
PATELLA HEIGHT-TOP	47.60	48.50	.90	1.85	49.03	1.43	2.92	-.54	-1.10
CALF HEIGHT	31.05	32.27	1.22	3.78	32.84	1.79	5.45	-.57	-1.77
VERTICAL REACH/SIT	128.70	128.95	.25	.19	130.10	1.40	1.08	-1.16	-.90
SITTING HEIGHT	84.45	85.44	.99	1.16	86.26	1.81	2.10	-.82	-.96
EYE HEIGHT/SITTING	72.71	74.02	1.31	1.77	74.81	2.10	2.81	-.80	-1.08
MID-SHOULDER HT/S	57.11	58.12	1.01	1.73	58.81	1.70	2.89	-.69	-1.19
KNEE HEIGHT/SITING	49.67	49.67	-.00	-.00	50.30	.63	1.24	-.63	-1.25
POPLITEAL HEIGHT	40.56	41.77	1.21	2.90	42.29	1.73	4.09	-.52	-1.24
CHEST DEPTH	20.18	21.01	.83	3.93	21.40	1.22	5.70	-.39	-1.84
CHEST BREADTH/SKIN	27.30	28.01	.71	2.55	28.46	1.16	4.08	-.45	-1.59
HIP BREADTH	30.13	30.23	.10	.34	30.76	.63	2.05	-.53	-1.75
OCCIPUT-EX CANTHUS	15.68	16.78	1.10	6.57	16.86	1.18	6.98	-.07	-.44
OCCIPUT-TRAGION	8.46	10.03	1.57	15.62	10.03	1.57	15.65	-.04	-.04
HEAD HEIGHT	11.90	12.85	.95	7.36	12.88	.98	7.64	-.04	-.30
SHOULDER-ELBOW LTH	33.82	34.09	.27	.78	34.52	.70	2.03	-.43	-1.27
FOREARM-HAND LTH	44.27	44.55	.28	.64	44.97	.70	1.55	-.42	-.93
BUTTOCK-KNEE LTH	54.85	54.40	-.45	-.83	55.25	.40	.73	-.85	-1.57
BUTTOCK-POPLITEAL	45.73	46.13	.40	.87	46.80	1.07	2.28	-.67	-1.45
BIDELTOID DIAMETER	41.42	42.01	.59	1.40	42.65	1.23	2.89	-.64	-1.54
MAX F"ARM-F"ARM BR	39.71	41.78	2.07	4.95	42.46	2.75	6.48	-.68	-1.64
HIP BREADTH/SITING	30.64	30.75	.11	.37	31.34	.70	2.24	-.59	-1.31
BIZYGOMATIC DIAM	13.08	13.50	.42	3.10	13.62	.54	3.94	-.12	-.88
BITRAGION DIAMETER	12.58	13.02	.44	3.37	13.14	.56	4.29	-.12	-.96
HEAD LENGTH	18.24	18.91	.67	3.55	19.02	.78	4.09	-.11	-.57
OCCIPUT-NASAL ROOT	17.88	18.58	.70	3.77	18.68	.80	4.28	-.10	-.53
OCCIPUT-PRONASALE	20.78	21.60	.82	3.81	21.68	.90	4.14	-.08	-.35
HEAD BREADTH	14.32	14.91	.59	3.98	15.33	.68	4.54	-.09	-.59
INTERPUPILLARY DIS	5.46	5.98	.52	8.75	5.99	.53	8.82	-.01	-.18
MENTON-NASAL ROOT	10.95	11.51	.56	4.89	11.63	.68	5.53	-.11	-.99
HAND LENGTH	17.50	17.84	.34	1.88	17.99	.49	2.77	-.15	-.84
PALM LENGTH	9.58	9.95	.37	3.76	10.04	.46	4.57	-.08	-.45
THUMB CROTCH-FFB	4.13	4.66	.53	11.29	4.68	.55	11.66	-.02	-.42
HAND BREADTH	8.11	8.36	.25	2.98	8.48	.37	4.36	-.12	-1.44
HEEL BREADTH	6.13	6.44	.31	4.81	6.50	.37	5.63	-.06	-.97
FOOT LENGTH	24.64	24.98	.34	1.37	25.17	.53	2.12	-.19	-.77
BALL OF FOOT LTH	17.90	18.29	.39	2.14	18.47	.57	3.07	-.18	-.96
BALL OF FOOT BR	8.97	9.20	.23	2.54	9.34	.37	3.96	-.14	-1.48
HEAD CIRCUMFERENCE	53.50	54.69	1.19	2.17	54.96	1.46	2.66	-.28	-.51
NECK CIRCUMFERENCE	34.17	35.13	.96	2.73	35.54	1.37	3.96	-.41	-1.14
SHOULDER CIRCUMFER	103.30	104.68	1.38	1.32	106.34	3.04	2.45	-1.65	-1.58
CHEST CIRCUMFER"CE	83.95	85.66	1.71	2.00	87.01	3.06	3.52	-1.35	-1.59
WAIST CIRCUMFRNCE	69.53	71.18	1.65	2.32	72.18	2.65	3.67	-1.00	-1.40
HIP CIRCUMFERENCE	84.97	85.24	.27	.32	86.75	1.78	2.05	-1.51	-1.77
ARM SCYE CIRCUMFER	39.60	40.70	1.10	2.70	41.56	1.96	4.71	-.86	-2.11
BICEPS CIRC/EXTEND	25.27	26.50	1.23	4.65	27.12	1.85	6.83		-2.34
WRIST CIRCUMFENCE	15.65	15.99	.34	2.12	16.15	.50	3.10		-1.02
HAND CIRCUMFE"NCE	19.82	20.44	.62	3.04	20.63	.81	3.90		-.90
BICEPS CIRC/FLXED	28.00	29.20	1.20	4.11	29.88	1.88	6.28		-2.31
FOREARM CIR/FLXED	26.03	27.05	1.02	3.77	27.54	1.51	5.49		-1.80
WAIST BACK LENGTH	39.50	41.43	1.93	4.05	42.31	2.81	6.65		-2.14
SHOULDER LENGTH	12.67	15.15	2.48	16.38	15.44	2.77	17.94		-1.91
INTERSCYE DISTANCE	33.98	36.38	2.42	6.66	36.92	3.04	8.24		-1.72
INTERSCYE MAXIMUM	46.47	49.01	2.54	5.17	49.55	3.38	6.21		-1.12

* TOTAL GROUP N = 6682, SMALL SHORT SUBGROUP N = 249

TABLE 1 (cont'd)

COMPARISON OF 5TH PERCENTILE VALU   SHORT SUBGROUP VALUES AND SMALL SIZE REGRESSION VALUES
                                           OF ARMY PERSONNEL *

                          WEIGHT IN KILOGRAMS .   .R MEASURMENT VALUES IN CENTIMETERS

VARIABLE NAME	5TH PERCENTILE	SMALL SHORT MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 5TH XILE		REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 5TH XILE		DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE	
			D	XD		D	XD	D	XD
SLEEVE LENGTH	79.36	79.54	.18	.22	80.61	1.25	1.55	-1.07	-1.35
SLEEVE INSEAM	44.13	44.98	.63	1.85	45.43	1.30	2.86	-.47	-1.14
VERTICAL TRUNK CIR	150.53	151.58	1.05	.69	153.11	2.58	1.69	-1.53	-1.01
UPPER THIGH CIRCUM	47.34	49.72	1.78	3.59	50.70	2.76	5.45	-.98	-1.97
LOWER THIGH CIRCUM	34.37	36.34	1.97	5.41	37.21	2.84	7.63	-.87	-2.40
CALF CIRCUMFERENCE	32.32	33.27	.95	2.85	33.93	1.61	4.75	-.66	-2.00
ANKLE CIRCUMFRNCE	21.46	21.03	.57	2.70	21.26	.80	3.75	-.23	-1.10
HEEL-ANKLE CIRCUMF	31.41	31.73	.32	1.02	32.08	.67	2.10	-.35	-1.11
INSTEP CIRCUMF"NCE	23.92	24.77	.85	3.45	25.10	1.18	4.70	-.32	-1.31
BALL OF FOOT CIRC	22.45	23.30	.85	3.66	23.70	1.25	5.27	-.39	-1.69
AGE	17.99	21.20	3.21	15.15	21.55	3.56	16.54	-.35	-1.66
WEIGHT/ESTIMATED	57.91	56.97	-.96	-1.69	58.41	.48	.82	-1.45	-2.54
STATURE/ESTIMATED	165.92	164.28	-1.64	-1.00	166.55	.63	.38	-2.27	-1.38

* TOTAL GROUP N = 6682, SMALL SHORT SUBGROUP N = 245

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TABLE 2

VARIABLE NAME	95TH PERCENTILE	LARGE LONG MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 95TH %ILE 0	%D	REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 95TH %ILE 0	%D	DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE 0	%D
WEIGHT	91.54	95.04	3.50	3.68	91.54	0.00	0.00	3.50	3.68
STATURE	185.64	186.98	1.34	.72	185.64	0.00	0.00	1.34	.72
CERVICALE HEIGHT	160.20	161.15	.95	.59	159.99	-.21	-.13	1.16	.72
SHOULDER HEIGHT	154.20	155.17	.97	.62	154.00	-.20	-.13	1.17	.75
WAIST HEIGHT	115.30	114.63	-.67	-.59	113.79	-1.51	-1.33	.84	.73
FUNCTIONAL REACH	90.91	88.68	-2.23	-2.52	87.89	-3.02	-3.44	.79	.89
CROTCH HEIGHT	91.75	90.10	-1.65	-1.83	89.37	-2.39	-2.67	.73	.81
PATELLA HEIGHT-TOP	58.41	57.06	-1.35	-2.37	56.78	-1.63	-2.87	.27	.48
CALF HEIGHT	40.03	38.36	-1.67	-4.35	38.05	-1.98	-5.21	.31	.82
VERTICAL REACH/SIT	147.86	147.66	-.20	-.14	146.77	-1.09	-.74	.89	.60
SITTING HEIGHT	96.70	95.72	-.98	-1.03	95.34	-1.36	-1.43	.38	.40
EYE HEIGHT/SITTING	84.68	83.35	-1.33	-1.59	82.83	-1.85	-2.23	.52	.62
MID-SHOULDER HT/S	67.64	66.45	-1.19	-1.79	66.20	-1.44	-2.17	.24	.37
KNEE HEIGHT/SITING	58.77	58.53	-.24	-.42	58.10	-.67	-1.15	.43	.73
POPLITEAL HEIGHT	48.84	46.95	-1.89	-4.04	46.83	-2.01	-4.29	.11	.24
CHEST DEPTH	26.74	25.94	-.80	-3.08	25.60	-1.14	-4.46	.34	1.32
CHEST BREADTH/SKIN	34.34	33.56	-.78	-2.33	33.37	-.97	-2.90	.19	.55
HIP BREADTH	36.75	36.67	-.08	-.23	36.28	-.47	-1.30	.39	1.06
OCCIPUT-EX CANTHUS	18.91	17.87	-1.04	-5.80	17.71	-1.20	-6.75	.16	.89
OCCIPUT-TRAGION	12.39	10.75	-1.64	-15.27	10.58	-1.81	-17.11	.17	1.58
HEAD HEIGHT	14.53	13.69	-.84	-6.15	13.63	-.90	-6.61	.06	.43
SHOULDER-ELBOW LTH	40.00	39.76	-.24	-.61	39.35	-.65	-1.64	.40	1.01
FOREARM-HAND LTH	51.95	51.61	-.34	-.65	51.14	-.81	-1.57	.47	.91
BUTTOCK-KNEE LTH	64.34	64.62	.28	.43	64.12	-.22	-.34	.50	.77
BUTTOCK-POPLITEAL	54.03	53.39	-.64	-1.20	53.10	-.93	-1.76	.29	.54
BIDELTOID DIAMETER	49.81	49.15	-.66	-1.35	48.92	-.89	-1.83	.23	.47
MAX F"ARM-F"ARM BR	53.62	51.40	-2.22	-4.33	50.95	-2.67	-5.25	.45	.83
HIP BREADTH/SITING	38.44	38.32	-.12	-.30	37.81	-.63	-1.67	.51	1.34
BIZYGOMATIC DIAM	14.95	14.51	-.44	-3.01	14.50	-.45	-3.12	.02	.11
BITRAGION DIAMETER	14.45	14.00	-.45	-3.20	13.96	-.49	-3.50	.04	.29
HEAD LENGTH	20.68	20.13	-.55	-2.72	19.99	-.69	-3.43	.14	.69
OCCIPUT-NASAL ROOT	20.29	19.73	-.56	-2.86	19.60	-.69	-3.52	.13	.64
OCCIPUT-PRONASALE	23.55	22.89	-.66	-2.90	22.77	-.78	-3.41	.11	.49
HEAD BREADTH	16.26	15.65	-.61	-3.48	15.62	-.64	-4.12	.06	.23
INTERPUPILLARY DIS	6.79	6.29	-.50	-7.89	6.30	-.49	-7.76	-.01	-.10
MENTON-NASAL ROOT	13.14	12.51	-.63	-5.07	12.48	-.66	-5.25	.03	.17
HAND LENGTH	20.67	20.32	-.35	-1.77	20.16	-.51	-2.54	.16	.79
PALM LENGTH	11.68	11.32	-.36	-3.17	11.20	-.48	-4.31	.12	1.10
THUMB CROTCH-FFB	5.85	5.33	-.52	-9.78	5.29	-.56	-10.53	.04	.68
HAND BREADTH	9.75	9.39	-.36	-3.87	9.39	-.36	-3.87	-.00	-.14
HEEL BREADTH	7.69	7.43	-.26	-3.48	7.32	-.37	-4.98	.11	1.43
FOOT LENGTH	28.98	28.79	-.19	-.67	28.53	-.45	-1.59	.26	.91
BALL OF FOOT LTH	21.40	21.22	-.18	-.85	20.94	-.46	-2.21	.28	1.33
BALL OF FOOT BR	10.77	10.47	-.30	-2.88	10.43	-.34	-3.26	.04	.37
HEAD CIRCUMFERENCE	58.84	57.85	-.99	-1.71	57.55	-1.29	-2.24	.30	.51
NECK CIRCUMFERENCE	41.02	40.14	-.88	-2.20	39.87	-1.15	-2.86	.27	.67
SHOULDER CIRCUMFER	124.44	122.60	-1.84	-1.50	122.28	-2.16	-1.77	.32	.27
CHEST CIRCUMFER"CE	105.94	103.72	-2.22	-2.14	102.99	-2.95	-2.87	.73	.70
WAIST CIRCUMFERNCE	96.07	93.39	-2.68	-2.87	91.49	-4.58	-5.01	1.90	2.04
HIP CIRCUMFERENCE	105.58	105.31	-.27	-.26	104.07	-1.51	-1.45	1.24	1.17
ARM SCYE CIRCUMFER	50.34	48.84	-1.50	-3.08	48.51	-1.83	-3.78	.33	.67
BICEPS CIRC/EXTEND	34.30	33.09	-1.21	-3.65	32.75	-1.55	-4.72	.34	1.04
WRIST CIRCUMFRNCE	18.58	18.24	-.34	-1.07	18.17	-.41	-2.26	.07	.42
HAND CIRCUMFERENCE	23.58	22.88	-.70	-3.04	22.78	-.80	-3.51	.10	.42
BICEPS CIRC/FLEXED	37.09	35.95	-1.14	-3.18	35.65	-1.44	-4.35	.30	.84
FOREARM CIR/FLEXED	33.15	32.11	-1.04	-3.24	31.93	-1.22	-3.82	.18	.56
WAIST BACK LENGTH	50.80	48.19	-2.61	-5.42	48.02	-2.78	-5.79	.17	.36
SHOULDER LENGTH	19.26	17.07	-2.19	-12.80	17.09	-2.17	-12.72	-.01	-.07
INTERSCYE DISTANCE	44.26	41.78	-2.48	-5.93	41.98	-2.28	-5.42	-.22	-.51
INTERSCYE MAXIMUM	58.99	56.72	-2.17	-3.82	56.57	-2.32	-4.10	.15	.27

TABLE 2 (cont'd)

COMPARISON OF 95TH PERCENTILE VALUES WITH LARGE-LONG SUBGROUP VALUES AND LARGE SIZE REGRESSION VALUES
1966 SURVEY OF ARMY PERSONNEL *

WEIGHT IN KILOGRAMS ALL OTHER MEASUREMENT VALUES IN CENTIMETERS

VARIABLE NAME	95TH PERCENTILE	LARGE LONG MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 95TH XILE		REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 95TH XILE		DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE	
			D	XD		D	XD	D	XD
SLEEVE LENGTH	92.49	92.46	-.03	-.03	91.65	-.84	-.91	.80	.87
SLEEVE INSEAM	53.05	52.32	-.73	-1.39	51.84	-1.21	-2.33	.48	.91
VERTICAL TRUNK CIR	178.71	179.13	.42	.24	177.38	-1.33	-.75	1.75	.98
UPPER THIGH CIRCUM	63.96	62.67	-1.29	-2.07	61.96	-2.00	-3.23	.71	1.13
LOWER THIGH CIRCUM	47.26	44.83	-2.43	-5.42	44.66	-2.60	-5.82	.17	.38
CALF CIRCUMFERENCE	41.18	40.38	-.80	-1.98	40.17	-1.01	-2.51	.21	.51
ANKLE CIRCUMFRNCE	25.24	24.64	-.60	-2.49	24.51	-.73	-2.97	.13	.51
HEEL-ANKLE CIRCUMF	36.94	36.69	-.25	-.68	36.47	-.47	-1.28	.22	.59
INSTEP CIRCUMF"NCE	29.40	28.52	-.88	-3.08	28.32	-1.08	-3.81	.20	.71
BALL OF FOOT CIRC	27.41	26.71	-.70	-2.61	26.61	-.80	-3.01	.10	.39
AGE	32.57	23.30	-9.27	-39.79	23.27	-9.30	-39.95	.03	.11
WEIGHT/ESTIMATED	92.44	95.30	2.86	3.01	92.02	-.42	-.46	3.29	3.45
STATURE/ESTIMATED	188.68	189.57	.89	.47	188.58	-.18	-.05	.98	.52

* TOTAL GROUP N = 6682, LARGE LONG SUBGROUP N = 219

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TABLE 3

COMPARISON OF 5TH PERCENTILE VALUES WITH SMALL-SHORT SUBGROUP VALUES AND SMALL SIZE REGRESSION VALUES
1977 SURVEY OF ARMY WOMEN *

WEIGHT IN KILOGRAMS ALL OTHER MEASURMENT VALUES IN CENTIMETERS

VARIABLE NAME	5TH PERCENTILE	SMALL SHORT MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 5TH XILE		REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 5TH XILE		DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE	
			D	XO		D	XO	D	XO
WEIGHT	46.75	45.69	-1.06	-2.33	46.75	0.00	0.00	-1.06	-2.33
STATURE	152.55	151.66	-.89	-.59	152.55	1.00	0.00	-.89	-.59
SHOULDER HEIGHT	123.90	123.23	-.67	-.54	123.95	.05	.04	-.72	-.59
AXILLA HEIGHT	114.32	114.06	-.26	-.23	114.61	.29	.25	-.55	-.48
BUSTPOINT HEIGHT	109.28	109.47	.19	.17	110.09	.81	.74	-.62	-.57
WAIST HEIGHT	93.20	93.48	.28	.30	94.17	.97	1.03	-.68	-.73
CROTCH HEIGHT	69.52	70.37	.85	1.20	70.61	1.09	1.55	-.25	-.35
BUTTOCK HEIGHT	76.37	77.41	1.04	1.35	77.44	1.07	1.38	-.02	-.03
KNEECAP HEIGHT	43.80	44.24	.45	1.02	44.39	.59	1.33	-.14	-.31
CALF HEIGHT	29.00	29.73	.73	2.45	29.81	.81	2.77	-.05	-.28
SITTING HEIGHT	79.01	79.91	.90	1.13	80.63	1.62	2.01	-.72	-.91
EYE HEIGHT/SIT	67.70	68.85	1.15	1.68	69.53	1.83	2.63	-.68	-.98
SHOULDER-ELBOW L	30.84	31.21	.37	1.17	31.25	.41	1.31	-.05	-.14
ELBOW-FINGERTIP	39.98	40.80	.82	2.01	40.73	.75	1.83	.07	.18
KNEE HEIGHT/SIT	46.90	46.95	.05	.12	47.22	.32	.68	-.27	-.57
POPLITEAL HEIGHT	37.97	38.51	.54	1.41	38.63	.66	1.71	-.12	-.30
BUTTOCK-KNEE LGTH	53.08	52.74	-.34	-.64	53.23	.15	.28	-.49	-.92
BUST DEPTH	19.60	20.49	.89	4.74	20.95	1.35	6.45	-.46	-2.26
WAIST DEPTH	15.33	16.45	1.12	6.89	16.47	1.14	6.91	-.02	-.12
CHEST BREADTH	25.38	26.16	.78	7.99	26.32	.94	1.57	-.16	-.61
WAIST BREADTH	22.10	23.10	1.00	4.33	23.19	1.09	4.68	-.09	-.37
HIP BREADTH	31.54	31.93	.39	1.23	32.41	.87	2.69	-.48	-1.50
SHOULDER BREADTH	38.42	39.09	.67	1.72	39.41	.99	2.51	-.32	-.91
NECK CIRCUMFERCNCE	29.86	30.56	.70	2.28	30.75	.89	2.88	-.19	-.61
SHOULDER CIRCUMFER	91.88	93.35	1.47	1.57	94.08	2.20	2.33	-.73	-.78
CHEST CIRC AT SCYE	77.54	78.62	1.08	1.37	79.84	2.30	2.88	-1.22	-1.55
BUST CIRCUMFERENCE	78.35	80.05	1.70	2.12	81.57	3.22	3.95	-1.52	-1.91
CHEST C BELOW BUST	67.37	68.45	1.08	1.58	69.47	2.10	3.02	-1.01	-1.48
WAIST CIRCUMFERENC	61.73	63.82	2.09	3.27	64.24	2.51	3.91	-.43	-.57
HIP CIRCUMFERENCE	85.50	85.75	.25	.29	87.16	1.66	1.90	-1.41	-1.65
VERTICAL TRUNK CIR	142.16	141.33	-.83	-.59	143.08	.92	.64	-1.74	-1.23
ARM CIRC AT SCYE	33.81	34.17	.36	1.05	34.65	.84	2.41	-.48	-1.40
BICEPS CIRC, FLXD	23.19	24.03	.84	3.68	24.57	1.38	5.62	-.54	-2.27
ELBOW CIRC FLXD	23.47	23.94	.47	1.96	24.12	.65	2.71	-.18	-.76
FOREARM CIRC, FLXD	22.15	22.71	.56	2.45	22.93	.78	3.40	-.22	-.98
WRIST CIRCUMFERENC	13.62	13.85	.23	1.64	13.93	.31	2.25	-.09	-.62
UPPER THIGH CIRCUM	49.35	50.06	.71	1.42	51.64	2.29	4.43	-1.57	-3.14
KNEE CIRCUMFERENCE	31.26	31.61	.35	1.11	32.03	.77	2.41	-.42	-1.34
CALF CIRCUMFERENCE	31.04	31.85	.81	2.53	32.40	1.36	4.20	-.55	-1.74
ANKLE CIRCUMFERENC	18.73	19.01	.28	1.47	19.44	.71	3.67	-.43	-2.29
SHOULDER LENGTH	13.29	14.52	1.23	9.49	14.31	1.02	7.11	.22	1.49
INTERSCYE BACK	33.95	35.80	1.85	5.16	36.05	2.10	5.84	-.26	-.72
INTERSCYE FRONT	30.38	31.90	1.52	4.75	31.48	1.10	3.49	.42	1.31
BACK ARC, BUST	37.04	38.46	1.42	3.69	38.94	1.90	4.89	-.48	-1.26
BACK ARC, WAIST	30.60	31.68	1.08	3.41	32.01	1.41	4.39	-.33	-1.03
BACK ARC, HIP	41.82	42.41	.59	1.40	43.38	1.56	3.59	-.96	-2.27
WAIST BACK	36.71	38.46	1.75	4.54	38.54	1.83	4.74	-.08	-.21
WAIST FRONT	32.79	34.60	1.81	5.23	34.67	1.88	5.41	-.07	-.19
NECK-BUSTPOINT LGT	21.94	23.16	1.22	5.27	23.53	1.59	6.75	-.37	-1.59
AXILLA-WAIST LEVEL	19.32	22.09	2.77	12.54	21.93	2.61	11.88	.16	.74
SLEEVE INSEAM	40.96	42.15	1.19	2.82	42.06	1.10	2.61	.09	.21
SLEEVE OUTSEAM	49.17	50.15	.98	1.96	50.07	.90	1.80	.08	.16
CROTCH LENGTH	63.73	64.93	1.20	1.85	67.12	3.39	5.05	-2.19	-3.37
HEAD CIRCUMFERENCE	52.34	53.45	1.11	2.08	53.65	1.31	2.43	-.20	-.37
HEAD BREADTH	13.76	14.29	.53	3.72	14.36	.60	4.18	-.07	-.48
HEAD LENGTH	17.61	18.13	.57	3.13	18.24	.63	3.43	-.06	-.32
PALM LENGTH	9.85	9.36	.31	3.35	9.38	.33	3.56	-.02	-.22
HAND BREADTH	7.18	7.31	.13	1.82	7.45	.27	3.63	-.14	-1.89
HAND CIRCUMFERENCE	17.05	17.39	.34	1.98	17.60	.55	3.13	-.21	-1.18
HAND LENGTH	16.06	16.47	.41	2.51	16.48	.42	2.56	-.01	-.06

* TOTAL GROUP N = 1330, SMALL SHORT SUBGROUP N = 55

TABLE 3 (cont'd)

COMPARISON OF 5TH PERCENTILE VALUES WITH SMALL-SHORT SUBGROUP VALUES AND SMALL SIZE REGRESSION VALUES
1977 SURVEY OF ARMY WOMEN *

WEIGHT IN KILOGRAMS ALL OTHER MEASURMENT VALUES IN CENTIMETERS

VARIABLE NAME	5TH PERCENTILE	SMALL SHORT MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 5TH XILE		REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 5TH XILE		DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE	
			D	%D		D	%D	D	%D
INSTEP LENGTH	16.28	16.70	.42	2.51	16.71	.43	2.55	-.01	-.04
FOOT LENGTH	22.34	22.69	.35	1.55	22.76	.42	1.86	-.07	-.31
HEEL-ANKLE CIRCUMF	28.48	28.69	.21	.74	28.93	.45	1.58	-.24	-.83
FOOT BREADTH	8.04	8.28	.24	2.88	8.39	.35	4.21	-.11	-1.39
HEEL BREADTH	5.45	5.77	.31	5.42	5.76	.30	5.21	.01	.22
FOOT CIRCUMFERENCE	20.75	21.19	.44	2.06	21.38	.63	2.96	-.19	-.92
INSTEP CIRCUMFEREN	21.50	22.00	.50	2.27	22.14	.64	2.68	-.14	-.62
ANKLE HEIGHT	9.22	10.33	1.11	10.72	10.14	.92	9.04	.19	1.85
SPHYRION HEIGHT	5.55	5.92	.37	6.28	6.11	.56	9.10	-.18	-3.11

* TOTAL GROUP N = 1330, SMALL SHORT SUBGROUP N = 55

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TABLE 4

COMPARISON OF 95TH PERCENTILE VALUES WITH LARGE-LONG SUBGROUP VALUES AND LARGE SIZE REGRESSION VALUES
1977 SURVEY OF ARMY WOMEN *

WEIGHT IN KILOGRAMS ALL OTHER MEASUREMENT VALUES IN CENTIMETERS

VARIABLE NAME	95TH PERCENTILE	LARGE LONG MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 95TH %ILE		REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 95TH %ILE		DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE	
			D	%D		D	%D	D	%D
WEIGHT	74.53	75.58	1.05	1.39	74.53	0.00	0.00	1.05	1.39
STATURE	174.09	174.79	.70	.40	174.09	0.00	0.00	.70	.40
SHOULDER HEIGHT	143.70	144.19	.49	.34	143.71	.01	.00	.48	.34
AXILLA HEIGHT	132.76	132.82	.06	.05	132.50	-.26	-.20	.33	.25
BUSTPOINT HEIGHT	127.78	127.52	-.26	-.20	127.06	-.72	-.57	.47	.37
WAIST HEIGHT	110.32	109.67	-.65	-.59	109.10	-1.22	-1.11	.57	.52
CROTCH HEIGHT	83.92	83.11	-.81	-.97	82.51	-1.41	-1.71	.61	.73
BUTTOCK HEIGHT	91.75	91.44	-.31	-.34	90.61	-1.14	-1.26	.84	.92
KNEECAP HEIGHT	52.51	52.21	-.30	-.58	51.65	-.86	-1.67	.56	1.08
CALF HEIGHT	36.58	36.04	-.54	-1.49	35.48	-1.10	-3.10	.56	1.55
SITTING HEIGHT	90.81	89.71	-1.10	-1.23	89.83	-.98	-1.09	-.13	-.14
EYE HEIGHT/SIT	79.13	77.90	-1.22	-1.57	78.04	-1.09	-1.39	-.14	-.18
SHOULDER-ELBOW L	36.56	36.11	-.45	-1.25	36.04	-.52	-1.43	.07	.18
ELBOW-FINGERTIP	47.51	47.00	-.51	-1.08	46.51	-1.00	-2.15	.50	1.05
KNEE HEIGHT/SIT	55.46	55.45	-.01	-.03	55.04	-.42	-.77	.41	.73
POPLITEAL HEIGHT	45.74	45.37	-.37	-.81	44.94	-.80	-1.77	.43	.95
BUTTOCK-KNEE LGTH	63.20	63.19	-.01	-.02	62.84	-.36	-.57	.74	.54
BUST DEPTH	26.79	25.13	-1.66	-6.60	25.10	-1.69	-6.74	.03	.13
WAIST DEPTH	22.23	20.45	-1.78	-8.71	20.31	-1.92	-9.46	.14	.68
CHEST BREADTH	31.40	30.64	-.76	-2.49	30.37	-1.03	-3.40	.27	.95
WAIST BREADTH	29.96	28.61	-1.35	-4.72	28.22	-1.74	-6.18	.39	1.37
HIP BREADTH	39.52	38.63	-.89	-2.29	38.60	-.92	-2.39	.04	.09
SHOULDER BREADTH	45.65	44.85	-.80	-1.78	44.93	-.72	-1.59	-.08	-.19
NECK CIRCUMFERENCE	35.01	34.14	-.87	-2.56	34.12	-.89	-2.59	.01	.03
SHOULDER CIRCUMFER	109.29	107.69	-1.60	-1.49	107.32	-1.97	-1.83	.36	.34
CHEST CIRC AT SCYE	94.28	92.26	-2.02	-2.19	91.83	-2.45	-2.66	.43	.46
BUST CIRCUMFERENCE	98.91	95.49	-3.42	-3.58	95.54	-3.37	-3.53	-.05	-.05
CHEST C BELOW BUST	83.32	80.76	-2.56	-3.17	80.72	-2.60	-3.23	.04	.05
WAIST CIRCUMFERENC	83.44	79.08	-4.36	-5.51	78.50	-4.94	-6.30	.58	.74
HIP CIRCUMFERENCE	106.03	104.91	-1.12	-1.06	104.68	-1.35	-1.29	.23	.22
VERTICAL TRUNK CIR	166.00	165.27	-.73	-.44	165.53	-.47	-.28	-.26	-.16
ARM CIRC AT SCYE	41.65	40.92	-.73	-1.79	40.67	-.98	-2.41	.25	.60
BICEPS CIRC, FLXD	30.67	29.66	-1.01	-3.42	29.42	-1.25	-4.24	.23	.79
ELBOW CIRC FLXD	28.78	28.32	-.46	-1.62	28.00	-.78	-2.79	.32	1.13
FOREARM CIRC, FLXD	27.13	26.66	-.47	-1.75	26.50	-.63	-2.39	.17	.63
WRIST CIRCUMFERENC	15.85	15.56	-.29	-1.85	15.55	-.30	-1.95	.02	.10
UPPER THIGH CIRCUM	64.47	62.76	-1.71	-2.73	62.74	-1.73	-2.76	.02	.03
KNEE CIRCUMFERENCE	38.64	37.76	-.88	-2.33	37.89	-.75	-1.99	-.12	-.33
CALF CIRCUMFERENCE	39.22	37.79	-1.43	-3.77	38.05	-1.17	-3.07	-.26	-.68
ANKLE CIRCUMFERENC	22.84	22.02	-.82	-3.72	22.14	-.70	-3.16	-.12	-.54
SHOULDER LENGTH	16.80	15.85	-.95	-6.00	15.74	-1.06	-6.72	.11	.68
INTERSCYE BACK	41.68	39.90	-1.78	-4.45	39.83	-1.85	-4.65	.08	.19
INTERSCYE FRONT	36.13	35.49	-.64	-1.81	35.01	-1.12	-3.22	.48	1.35
BACK ARC, BUST	47.31	45.31	-2.00	-4.41	45.31	-2.00	-4.41	.00	.01
BACK ARC, WAIST	41.58	39.34	-2.24	-5.69	38.95	-2.63	-6.75	.39	.99
BACK ARC, HIP	53.92	52.11	-1.81	-3.47	52.04	-1.88	-3.61	.07	.13
WAIST BACK	45.38	43.46	-1.92	-4.42	43.34	-2.04	-4.71	.12	.28
WAIST FRONT	41.32	39.40	-1.92	-4.86	38.98	-2.34	-6.01	.43	1.08
NECK-BUSTPOINT LGT	28.78	27.44	-1.34	-4.69	27.21	-1.57	-5.79	.23	.85
AXILLA-WAIST LEVEL	27.52	24.51	-3.01	-12.28	24.36	-3.16	-12.98	.15	.63
SLEEVE INSEAM	49.56	48.44	-1.12	-2.32	48.25	-1.31	-2.71	.19	.38
SLEEVE OUTSEAM	58.93	58.20	-.73	-1.25	57.79	-1.14	-1.98	.42	.72
CROTCH LENGTH	81.40	78.55	-2.93	-3.73	79.20	-2.22	-2.80	-.71	-.91
HEAD CIRCUMFERENCE	57.74	56.47	-1.27	-2.25	56.31	-1.43	-2.54	.16	.28
HEAD BREADTH	15.54	14.97	-.57	-3.83	14.89	-.65	-4.35	.08	.50
HEAD LENGTH	19.81	19.27	-.54	-2.81	19.22	-.59	-3.09	.05	.27
PALM LENGTH	10.78	10.49	-.29	-2.79	10.42	-.36	-3.48	.07	.67
HAND BREADTH	8.46	8.25	-.21	-2.51	8.22	-.24	-2.94	.03	.42
HAND CIRCUMFERENCE	19.87	19.39	-.48	-2.45	19.37	-.50	-2.60	.03	.14
HAND LENGTH	19.04	18.65	-.39	-2.69	18.47	-.57	-3.17	.18	.95

* TOTAL GROUP N = 1330, LARGE LONG SUBGROUP N = 55

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TABLE 4 (cont'd)

COMPARISON OF 95TH PERCENTILE VALUES WITH LARGE-LONG SUBGROUP VALUES AND LARGE SIZE REGRESSION VALUES
1977 SURVEY OF ARMY WOMEN *

WEIGHT IN KILOGRAMS ALL OTHER MEASURMENT VALUES IN CENTIMETERS

VARIABLE NAME	95TH PERCENTILE	LARGE LONG MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 95TH %ILE		REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 95TH %ILE		DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE	
			D	%D		D	%D	D	%D
INSTEP LENGTH	19.55	19.21	-.34	-1.77	19.89	-.46	-2.42	.12	.63
FOOT LENGTH	26.47	26.21	-.26	-1.01	25.99	-.48	-1.84	.21	.81
HEEL-ANKLE CIRCUMF	33.29	32.85	-.44	-1.33	32.80	-.49	-1.49	.05	.15
FOOT BREADTH	9.73	9.40	-.33	-3.49	9.38	-.35	-3.74	.02	.24
HEEL BREADTH	6.82	6.52	-.30	-4.66	6.45	-.37	-5.78	.07	1.05
FOOT CIRCUMFERENCE	24.52	23.96	-.56	-2.33	23.94	-.58	-2.42	.02	.09
INSTEP CIRCUMFEREN	25.66	25.02	-.64	-2.56	24.94	-.72	-2.89	.08	.32
ANKLE HEIGHT	12.57	11.79	-.78	-6.66	11.62	-.95	-8.17	.16	1.48
SPHYRION HEIGHT	7.34	6.83	-.51	-7.48	6.85	-.49	-7.22	-.02	-.24

* TOTAL GROUP N = 1338, LARGE LONG SUBGROUP N = 55

TABLE 5

COMPARISON OF 5TH PERCENTILE VALUES WITH SMALL-SHORT SUBGROUP VALUES AND SMALL SIZE REGRESSION VALUES
1967 SURVEY OF USAF FLYING PERSONNEL *

WEIGHT IN KILOGRAMS ALL OTHER MEASUREMENT VALUES IN CENTIMETERS

VARIABLE NAME	5TH PERCENTILE	SMALL SHORT MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 5TH XILE		REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 5TH XILE		DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE	
			D	%D		D	%D	D	%D
WEIGHT	63.59	61.51	-2.08	-3.38	63.59	3.00	0.00	-2.08	-3.38
HEIGHT (STATURE)	167.29	165.38	-1.91	-1.16	167.29	3.00	0.00	-1.91	-1.16
AGE	22.35	26.94	6.63	22.87	29.53	7.18	26.12	-.56	-1.42
GRIP STRENGTH	44.36	51.20	6.80	13.39	50.91	6.57	12.91	.29	.55
CERVICALE HEIGHT	142.93	140.61	-1.92	-1.37	142.67	.14	.17	-2.06	-1.47
ACROMION HEIGHT	135.74	133.65	-2.09	-1.56	135.90	.16	.12	-2.25	-1.65
RADIALE HEIGHT	104.95	103.47	-1.47	-1.37	104.37	.27	.21	-1.64	-1.59
STYLION HEIGHT	80.18	79.64	-.54	-.66	80.89	.71	.88	-1.25	-1.57
DACTYLION HEIGHT	61.54	61.25	-.29	-.47	62.49	.95	1.52	-1.24	-2.02
SUPRASTERNALE HGHT	136.26	134.50	-1.76	-1.31	136.26	-.00	-.00	-1.76	-1.36
NIPPLE HEIGHT	120.80	119.68	-1.12	-.94	121.21	.41	.34	-1.53	-1.28
WAIST HT-OMPHALION	98.71	98.12	-.59	-.60	99.64	.93	.93	-1.53	-1.55
ILIOCRISTALE HT	101.38	100.28	-1.10	-1.10	101.86	.48	.48	-1.58	-1.55
BUTTOCK HEIGHT	83.06	82.60	-.46	-.55	83.90	.86	1.05	-1.30	-1.54
TROCHANTERION HGHT	96.93	96.46	-.47	-.54	97.46	.93	1.06	-1.40	-1.62
GLUTEAL FURROW HGT	74.67	74.29	-.38	-.51	75.58	.91	1.20	-1.29	-1.71
CROTCH HEIGHT	78.37	78.33	-.04	-.05	79.63	1.26	1.54	-1.30	-1.66
PATELLA TOP HEIGHT	48.50	48.34	-.16	-.33	49.05	.55	1.12	-.71	-1.46
KNEE CIRC HEIGHT	49.60	49.48	-.18	-.39	50.14	.68	1.04	-.56	-1.05
FIBULAR HEIGHT	40.23	40.14	-.09	-.21	40.79	.56	1.37	-.64	-1.42
CALF HEIGHT	31.98	32.35	.37	1.16	32.83	.82	2.51	-.45	-1.40
ANKLE HEIGHT	12.00	12.76	.76	5.96	12.88	.88	6.43	-.12	-.93
SITTING HEIGHT	88.16	88.48	.34	.38	88.96	.42	.92	-.48	-.54
EYE HEIGHT/SITTING	76.15	76.68	.53	.69	77.23	1.08	1.43	-.55	-.72
MIDSHOULDER HT/SIT	66.23	66.26	.03	.05	67.10	.87	1.43	-.84	-1.34
ACROMION HGHT/SIT	56.46	56.73	.27	.47	57.64	1.18	2.02	-.89	-1.57
ELBOW REST HGT/SIT	20.96	23.54	2.58	10.97	23.93	2.99	12.51	-.41	-1.70
KNEE HEIGHT/SITT'G	51.73	51.22	-.51	-1.00	51.96	.25	.49	-.74	-1.50
POPLITEAL HGHT/SIT	40.94	40.43	-.51	-.97	40.94	.89	2.19	-.50	-1.24
BUTTOCK-KNEE LNGTH	56.96	55.54	-.51	-.92	56.42	.37	.66	-.88	-1.59
BUTTOCK-POPLITEAL	46.11	46.13	.02	.05	46.97	.86	1.88	-.86	-1.55
ACRM-NICCP CIP LVL	16.65	17.11	.77	4.69	17.76	1.21	6.95	-.65	-2.54
SHOULDER-ELBOW LTH	13.18	13.26	.12	.37	13.83	.67	1.99	-.58	-1.66
ACROMION-RADIALE L	30.16	30.31	.15	.51	30.93	.77	2.45	-.61	-2.02
FLOOR-WAIST LENGTH	27.70	27.85	.15	.52	28.26	.56	1.94	-.41	-1.49
RADIALE-STYLION LN	24.58	24.73	.15	.63	25.21	.63	2.63	-.61	-2.37
ELBOW-GRIP LENGTH	32.59	32.74	.15	.47	33.19	.60	1.82	-.45	-1.38
THUMB-TIP REACH	73.87	75.04	1.17	1.58	75.65	1.51	2.34	-.64	-.85
THUMB-TIP R'CH/XTD	82.26	83.62	1.36	1.65	84.67	2.41	2.84	-1.04	-1.25
SLEEVE INSEAM	44.41	45.13	.72	1.60	45.70	1.34	3.02	-.66	-1.40
BIACROMIAL BREADTH	37.47	38.95	1.48	3.74	39.04	1.57	4.03	-.19	-.28
BIDELTOID BREADTH	44.11	44.65	.54	1.20	45.17	1.26	2.75	-.72	-1.62
CHEST BREADTH	29.47	29.97	.50	1.67	30.61	1.14	1.71	-.64	-2.12
WAIST BRDTH-OMPH'N	27.18	27.36	.18	.67	28.20	1.02	3.63	-.84	-3.14
BICRISTALE BREADTH	24.46	25.19	.73	2.81	25.93	1.48	5.04	-.74	-1.91
HIP BREADTH	32.29	32.30	.01	.04	32.80	.60	1.81	-.50	-1.42
HIP BREADTH SITT'G	34.16	34.16	-.01	-.00	34.90	.74	2.13	-.74	-2.14
ELBOW BRDTH BONE/R	6.49	6.53	.04	.62	6.75	.26	3.86	-.21	-.30
ELBOW BRDTH BONE/L	6.52	6.74	.22	3.37	6.76	.24	3.5	-.02	-.23
FOREARM ARM BRDTH	40.17	40.81	1.64	3.35	41.44	2.68	5.33	-1.03	-2.08
KNEE BRDTH BONE/R	9.25	9.42	.17	1.82	9.67	.42	3.02	-.24	-.42
KNEE BRDTH BONE/L	9.36	9.53	.17	1.78	9.66	.30	3.13	-.14	-.51
CHEST DEPTH	21.16	22.13	.70	3.57	22.67	1.31	5.61	-.53	-2.41
WAIST DEPTH-OMPH'N	18.33	19.06	.71	3.60	20.31	1.92	6.97	-.67	-5.41
BUTTOCK DEPTH	20.73	21.16	.43	2.05	21.44	1.13	4.27	-.77	-3.71
THIGH CLEARANCE HT	14.39	14.97	.09	.54	16.32	.93	6.13	-.96	-1.67
NECK CIRC -MAXIMUM	36.04	36.14	.04	2.54	36.97	1.23	3.34	-.24	-.50
SHOULDER CIRCUM'CE	108.42	109.03	.61	.56	111.89	3.49	2.29	-1.86	-1.71
CHEST CIRC AT SCYE	97.46	98.74	1.28	1.41	99.66	3.19	3.13	-1.87	-1.99
CHEST CIRCUMFERENCE	86.97	88.74	1.10	1.30	91.67	4.13	4.14	-1.93	-3.15

* TOTAL GROUP N = 2420, SMALL SHORT SUBGROUP N = 93

TABLE 5 (cont'd)

COMPARISON OF 5TH PERCENTILE VALUES WITH SMALL-SHORT SUBGROUP VALUES AND SMALL SIZE REGRESSION VALUES
1967 SURVEY OF USAF FLYING PERSONNEL *

WEIGHT IN KILOGRAMS ALL OTHER MEASURMENT VALUES IN CENTIMETERS

VARIABLE NAME	5TH PERCENTILE	SMALL SHORT MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 5TH %ILE		REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 5TH %ILE		DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE	
			D	%D		D	%D	D	%D
CALF CIRCUMF/RIGHT	33.59	34.17	.57	1.96	34.35	1.35	3.85	-.67	-1.97
CALF CIRCUMF/LEFT	33.25	33.95	.71	2.15	34.57	1.32	3.87	-.62	-1.42
ANKLE CIRCUMFERENCE	20.42	20.91	.49	2.33	21.09	.67	3.19	-.19	-.90
SCYE CIRCUMFERENCE	43.73	44.37	.32	.73	45.23	1.48	3.27	-1.16	-2.63
BICEPS C-EXTEND/RT	26.96	28.00	1.04	3.71	28.58	1.62	5.65	-.58	-2.96
BICEPS C-EXTEND/LT	26.55	27.86	1.31	4.72	28.16	1.61	5.73	-.33	-1.37
BICEPS C-FLEXED/RT	29.09	29.97	.88	2.95	30.53	1.49	4.05	-.61	-2.13
BICEPS C-FLEXED/LT	28.49	29.62	1.13	3.82	29.93	1.44	4.81	-.31	-1.04
ELBOW CIR-EXTENDED	25.38	25.69	.31	1.19	26.03	.65	2.49	-.34	-1.33
ELBOW CIRC-FLEXED	28.47	28.93	.46	1.59	29.48	1.01	3.43	-.55	-1.90
LOWER ARM C-EXTEND	25.81	26.27	.46	1.74	26.56	.75	2.81	-.29	-1.10
LOWER ARM C-FLEXED	27.25	27.76	.51	1.83	28.12	.87	3.11	-.37	-1.32
WRIST CIRCUMFERENCE	16.19	16.64	.45	2.69	16.70	.51	3.03	-.06	-.34
SLVE L/SPINE-SCYE	25.49	26.64	1.15	4.33	26.93	1.44	5.34	-.29	-1.07
SLVE L/SPINE-ELBOW	56.42	56.50	.08	.14	57.23	.81	1.41	-.73	-1.29
SLVE L/SPINE-WRIST	85.20	84.64	-.56	-.66	85.92	.62	.72	-1.18	-1.40
ANTERIOR NECK LGTH	5.49	8.18	2.69	32.90	8.19	2.70	32.96	-.01	-.05
POSTERIOR NECK LTH	10.59	13.07	2.46	18.95	12.91	2.32	18.00	.16	1.15
SHOULDER LENGTH	14.61	15.61	1.00	6.43	15.76	1.17	7.41	-.16	-1.05
DELTOID ARC	13.89	14.75	.86	5.83	14.89	.99	6.64	-.13	-.94
INTERSCYE	32.52	36.48	3.96	10.85	36.76	4.24	11.54	-.28	-.78
INTERSCYE MAXIMUM	56.58	57.22	.64	1.13	58.05	1.47	2.54	-.87	-1.45
WAIST FRONT-OMPHN	36.93	37.78	.85	2.25	38.16	1.23	3.23	-.38	-1.01
CROTCH LGTH-OMPHN	63.56	64.34	.78	1.21	65.47	1.91	2.92	-1.13	-1.76
WAIST BACK-OMPHLN	43.10	43.75	.65	1.49	44.39	1.29	2.88	-.63	-1.44
FOOT LENGTH	25.13	25.61	.48	1.89	25.58	.45	1.75	.04	.14
INSTEP LENGTH	18.25	18.75	.50	2.65	18.73	.48	2.57	.02	.09
FOOT BREADTH	8.99	9.22	.23	2.46	9.31	.32	3.41	-.09	-.93
BALL-OF-FOOT CIRC	22.91	23.38	.47	2.00	23.56	.65	2.75	-.18	-.76
INSTEP CIRCUMFNCE	23.83	24.19	.36	1.50	24.33	.50	2.04	-.13	-.55
HEEL CIRCUMFERENCE	31.66	31.83	.17	.54	32.02	.36	1.13	-.19	-.59
BI-MALLEOLAR BRDTH	6.72	6.91	.19	2.70	6.94	.22	3.20	-.04	-.54
LAT'L MALLEOLUS HT	6.16	6.49	.33	5.04	6.59	.43	6.51	-.10	-1.58
MED'L MALLEOLUS HT	7.64	8.07	.43	5.33	8.11	.47	5.84	-.04	-.54
HAND LENGTH	17.79	18.07	.28	1.54	18.20	.41	2.23	-.13	-.70
PALM LENGTH	9.97	10.23	.26	2.47	10.33	.36	3.47	-.10	-.93
HAND BR/METACARPLE	8.24	8.54	.30	3.47	8.53	.29	3.38	.01	.10
HAND BRTH AT THUMB	9.41	9.67	.26	2.66	9.73	.32	3.24	-.06	-.63
HAND C/METACARPALE	20.04	20.59	.55	2.66	20.65	.61	2.95	-.06	-.31
HAND C ROUND THUMB	24.06	24.60	.54	2.21	24.60	.54	2.21	-.00	-.10
HAND THICK/META-3	2.42	2.67	.25	9.32	2.67	.25	9.21	.00	.13
HEAD CIRCUMFERENCE	55.23	56.27	1.04	1.84	56.47	1.24	2.19	-.20	-.36
SAGITTAL ARC/INION	31.87	34.21	2.34	6.85	34.14	2.27	6.66	.07	.21
MINIMUM FRONTL ARC	12.32	13.35	1.03	7.70	13.38	1.06	7.94	-.03	-.26
BITRAGION-CORONAL	33.68	34.83	1.15	3.31	35.01	1.33	3.79	-.18	-.50
BITRAGN-MIN FRNTAL	29.19	29.96	.77	2.58	30.15	.96	3.19	-.19	-.62
BITRAGN-SUBNASALE	27.62	28.54	.92	3.24	28.57	.95	3.34	-.03	-.10
BITRAGION-MENTON	30.63	31.41	.78	2.48	31.56	.93	2.94	-.15	-.47
BIT-SUBMANDIBULAR	28.40	29.51	1.11	3.77	29.68	1.28	4.30	-.16	-.55
BITRAGN-POSTERIOR	27.21	28.65	1.44	5.02	28.73	1.52	5.27	-.08	-.27
HEAD LENGTH	18.77	19.46	.69	3.54	19.51	.74	3.79	-.05	-.26
HEAD DIAGNL/MENTON	24.38	24.89	.51	2.03	24.98	.60	2.41	-.10	-.39
HD DIAG/INION-NOSE	20.23	21.48	1.25	5.83	21.46	1.23	5.72	.02	.12
EAR BREADTH	3.32	3.63	.31	8.65	3.69	.37	10.06	-.06	-1.57
EAR LENGTH	5.92	6.25	.33	5.34	6.37	.45	7.05	-.12	-1.54
EAR L ABVE TRAGION	2.48	2.82	.34	12.10	2.87	.39	13.61	-.05	-1.75
HEAD BREADTH	14.73	15.31	.58	3.82	15.36	.63	4.09	-.04	-.27
MAXIMUM FRONTAL BR	10.87	11.36	.49	4.31	11.37	.50	4.37	-.01	-.06
BITRAGION BREADTH	13.35	13.90	.55	3.98	13.92	.57	4.10	-.02	-.13
BIZYGOMATIC BRDTH	13.39	13.87	.48	3.44	13.89	.50	3.58	-.02	-.14

* TOTAL GROUP N = 2420, SMALL SHORT SUBGROUP N = 61

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TABLE 5 (concl'd)

COMPARISON OF 5TH PERCENTILE VALUES WITH SMALL-SHORT SUBGROUP VALUES AND SMALL SIZE REGRESSION VALUES
1967 SURVEY OF USAF FLYING PERSONNEL *

WEIGHT IN KILOGRAMS ALL OTHER MEASURMENT VALUES IN CENTIMETERS

VARIABLE NAME	5TH PERCENTILE	SMALL SHORT MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 5TH %ILE		REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 5TH %ILE		DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE	
			D	%D		D	%D	D	%D
WAIST CIR-OMPHAL'N	75.76	77.23	1.47	1.90	79.56	3.90	4.78	-2.33	-3.02
WAIST CIR-OMPH/SIT	75.36	77.38	2.02	2.61	79.81	4.45	5.57	-2.43	-3.14
BUTTOCK CIRCUMF'CE	89.74	89.70	-.04	-.05	91.40	1.66	1.82	-1.71	-1.99
BUTTOCK CIRCUM/SIT	96.97	97.26	.29	.30	99.23	2.26	2.28	-1.97	-2.03
VERTICAL TRUNK CIR	156.65	154.19	-2.46	-1.59	157.22	.57	.37	-3.03	-1.97
VERT TRUNK CIR/SIT	150.37	148.69	-1.68	-1.13	151.14	.77	.51	-2.45	-1.65
SCROTALE-ANT WAIST	25.26	26.24	1.04	3.98	26.57	1.37	5.15	-.32	-1.23
SCROTALE-A WAIST/S	22.77	23.81	1.05	4.52	24.01	1.24	5.32	-.20	-.85
SCRTL-SUPRASTERNLE	63.47	63.81	.34	.53	64.61	1.14	1.76	-.80	-1.26
SCRTL-SUPRSTRNLE/S	58.79	59.53	.74	1.24	60.06	1.27	2.11	-.53	-.89
SCRTL-ANT SCYE LVL	48.90	49.42	.52	1.05	50.25	1.35	2.69	-.83	-1.69
SCRTL-ANT SCYE L/S	43.70	45.06	1.36	2.38	45.69	1.93	4.23	-.67	-1.41
SCRTL-A MIDSHOULDR	71.41	71.18	-.23	-.32	72.43	1.02	1.41	-1.25	-1.75
SCRTL-A MUSHLDR/S	67.04	67.09	.05	.07	68.22	1.18	1.74	-1.17	-1.69
SCROTALE-PST WAIST	30.58	32.05	1.47	4.59	32.66	2.08	6.38	-.61	-1.91
SCRTL-WAIST OVR BK	37.76	39.23	1.47	3.76	39.73	1.97	4.95	-.49	-1.25
SCROTALE-P WAIST/S	31.44	33.80	2.36	6.99	34.17	2.73	7.98	-.37	-1.08
SCRTL-WAIST/BUTT/S	34.79	36.93	2.14	5.80	37.14	2.35	6.32	-.20	-.55
SCROTALE-CERVICALE	76.14	75.20	.06	.08	77.48	1.34	1.73	-1.28	-1.69
SCROTALE-CERVCLE/S	77.34	78.28	.44	.56	79.43	1.59	2.01	-1.16	-1.48
SCRTL-PST SCYE LVL	56.27	57.15	.88	1.54	58.16	1.89	3.25	-1.01	-1.76
SCRTL-PST SCYE L/S	58.76	59.79	1.03	1.72	60.68	1.92	3.16	-.89	-1.49
SCRTL-P MIDSHOULDR	78.75	78.62	-.13	-.17	79.94	1.19	1.49	-1.33	-1.69
SCRTL-MUSHLD OVR B	84.74	84.69	-.05	-.05	85.97	1.23	1.44	-1.28	-1.51
SCRTL-P MUSHLDR/S	80.44	81.01	.57	.70	81.95	1.51	1.84	-.94	-1.16
SCRTL-MUSHLD O B/S	82.58	82.80	.22	.26	83.91	1.33	1.59	-1.12	-1.35
UPPER THIGH CIRCUM	51.52	52.89	1.37	2.59	53.97	2.45	4.53	-1.08	-2.03
UPPER THIGH C/SIT	50.79	51.77	.98	1.89	53.00	2.21	4.17	-1.23	-2.37
KNEE CIRCUMFERENCE	35.38	35.46	.08	.23	35.97	.59	1.65	-.51	-1.44
KNEE CIRCUMFCE/SIT	35.97	36.06	.09	.24	36.47	.50	1.38	-.42	-1.16
BIGONIAL BREADTH	10.63	11.23	.60	5.38	11.37	.74	6.49	-.13	-1.19
EAR-TO-EAR BREADTH	17.54	18.40	.86	4.85	18.43	.89	4.82	-.03	-.18
BIOCULAR BREADTH	8.41	9.01	.60	6.67	9.01	.60	6.71	-.00	-.03
INTERPUPILLARY BRD	5.69	6.09	.40	6.62	6.15	.46	7.46	-.05	-.90
INTEROCULAR BR'DTH	2.88	3.25	.37	11.32	3.26	.38	11.62	-.01	-.34
NOSE BREADTH	3.13	3.46	.34	9.82	3.47	.37	10.72	-.03	-1.00
LIP LENGTH	4.60	5.12	.52	10.15	5.13	.53	10.31	-.01	-.18
EAR PROTRUSION	1.65	2.10	.45	21.55	2.09	.44	21.17	.01	.48
SUBNASALE-NASAL RT	4.51	4.99	.46	9.62	5.01	.50	9.95	-.02	-.77
PHILTRUM LENGTH	1.12	1.53	.41	26.85	1.51	.39	25.64	.02	1.63
LIP-TO-LIP LENGTH	1.07	1.78	.71	39.79	1.73	.66	38.29	.04	2.43
MENTON-SUBNASALE L	6.05	6.71	.66	9.86	6.71	.66	9.87	-.00	-.01
MENTON-NASAL ROOT	11.04	11.65	.61	5.24	11.71	.67	5.70	-.06	-.49
GLABELLA-TO-VERTEX	7.71	8.97	1.26	16.17	9.15	1.44	15.76	-.18	-2.01
NASAL ROOT-TO-VRTX	9.25	10.33	1.08	13.49	10.51	1.26	11.95	-.17	-1.65
XTRNL CANTHUS-VRTX	10.71	11.52	.81	7.62	11.72	1.01	8.59	-.20	-1.73
PRONASALE-TO-VRTX	13.01	14.23	1.22	8.57	14.45	1.44	9.97	-.22	-1.56
SUBNASALE-TO-VRTX	14.43	15.60	1.17	7.50	15.74	1.31	8.34	-.14	-.91
STOMION-TO-VERTEX	16.74	17.87	1.13	6.32	17.99	1.25	6.96	-.12	-.69
MENTON-TO-VERTEX	21.07	22.09	1.02	4.62	22.28	1.21	5.42	-.19	-.84
TRAGION-TO-VERTEX	12.42	13.11	.69	5.25	13.21	.79	5.98	-.10	-.78
GLABELLA-TO-WALL	19.26	19.88	.62	3.12	19.96	.70	3.53	-.08	-.42
NASAL ROOT-TO-WALL	19.11	19.74	.63	3.17	19.79	.68	3.45	-.06	-.29
XTRNL CANTHUS-WALL	16.70	17.52	.82	4.69	17.51	.81	4.65	.01	.04
PRONASALE-TO-WALL	21.39	22.23	.84	3.78	22.25	.86	3.86	-.02	-.08
SUBNASALE-TO-WALL	19.67	20.65	.98	4.75	20.59	.92	4.47	.06	.29
LIP PROMIN'CE-WALL	19.71	20.84	1.13	5.43	20.74	1.03	4.95	.11	.51
CHIN PROMINCE-WALL	18.72	19.97	1.25	6.26	19.93	1.21	6.06	.04	.21
TRAGION-TO-WALL	9.29	10.30	1.01	9.05	10.19	.90	8.34	.11	1.10

* TOTAL GROUP N = 2420, SMALL SHORT SUBGROUP N = 61

TABLE 6

COMPARISON OF 95TH PERCENTILE VALUES WITH LARGE-LONG SUBGROUP VALUES AND LARGE SIZE REGRESSION VALUES
1967 SURVEY OF USAF FLYING PERSONNEL *

WEIGHT IN KILOGRAMS ALL OTHER MEASUREMENT VALUES IN CENTIMETERS

VARIABLE NAME	95TH PERCENTILE	LARGE LONG MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 95TH XILE D	XD	REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 95TH XILE D	XD	DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE D	XD
WEIGHT	95.70	98.27	2.57	2.61	95.70	3.00	0.00	2.57	2.61
HEIGHT (STATURE)	187.69	188.58	.89	.47	187.69	0.03	0.00	.89	.47
AGE	42.58	30.02	-12.56	-41.83	30.70	-11.88	-38.68	-.68	-2.27
GRIP STRENGTH	69.56	62.37	-7.19	-11.53	62.33	-7.23	-11.59	.03	.05
CERVICALE HEIGHT	161.75	162.52	.77	.47	161.77	.02	.01	.75	.46
ACROMION HEIGHT	154.77	155.69	.92	.55	154.86	.09	.06	.83	.53
RADIALE HEIGHT	120.02	120.55	.53	.44	119.81	-.21	-.18	.74	.52
STYLION HEIGHT	93.22	93.22	-.00	-.00	92.49	-.74	-.80	.73	.79
DACTYLION HEIGHT	73.20	72.73	-.47	-.65	72.06	-1.14	-1.56	.67	.92
SUPRASTERNALE HGHT	154.45	155.39	.94	.60	154.52	.07	.04	.87	.56
NIPPLE HEIGHT	138.37	138.51	.44	.31	137.52	-.56	-.40	.99	.71
WAIST HT-OMPHALION	114.31	113.74	-.57	-.51	113.46	-.85	-.75	.27	.24
ILIOCRISTALE HT	117.10	117.03	-.17	-.15	116.70	-.50	-.43	.33	.28
BUTTOCK HEIGHT	97.50	96.96	-.54	-.56	96.51	-.99	-1.03	.45	.46
TROCHANTERION HGHT	101.26	100.44	-.82	-.81	100.23	-1.03	-1.03	.21	.21
GLUTEAL FURROW HGT	87.87	87.20	-.67	-.77	86.80	-1.07	-1.24	.40	.46
CROTCH HEIGHT	92.03	90.76	-1.27	-1.46	90.61	-1.42	-1.56	.15	.16
PATELLA TOP HEIGHT	56.94	56.44	-.50	-.88	56.29	-.65	-1.15	.15	.27
KNEE CIRC HEIGHT	53.85	53.44	-.41	-.77	53.26	-.59	-1.11	.18	.34
FIBULAR HEIGHT	47.62	47.14	-.48	-1.03	47.03	-.59	-1.25	.10	.22
CALF HEIGHT	39.28	38.66	-.62	-1.61	38.39	-.89	-2.33	.27	.71
ANKLE HEIGHT	15.79	14.57	-1.22	-8.36	14.57	-1.22	-8.35	-.00	-.01
SITTING HEIGHT	98.56	98.15	-.41	-.41	97.55	-1.01	-1.03	.60	.61
EYE HEIGHT/SITTING	86.11	85.45	-.66	-.77	84.79	-1.32	-1.56	.66	.78
MIDSHOULDER HT/SIT	69.23	68.89	-.34	-.49	68.27	-.96	-1.41	.62	.90
ACROMION HGHT/SIT	65.88	65.21	-.67	-1.03	64.65	-1.23	-1.90	.56	.86
ELBOW REST HGT/SIT	29.56	26.95	-2.59	-9.62	26.51	-3.03	-11.42	.43	1.61
KNEE HEIGHT/SITT'G	59.96	59.96	-.00	-.00	59.70	-.26	-.46	.26	.40
POPLITEAL HGHT/SIT	47.46	46.76	-.71	-1.50	46.50	-.96	-2.02	.26	.51
BUTTOCK-KNEE LNGTH	64.96	64.90	-.06	-.09	64.64	-.32	-.49	.26	.40
BUTTOCK-POPLITEAL	54.60	54.19	-.41	-.76	53.99	-.61	-1.12	.19	.35
ACRM-BICEP CIR LVL	21.51	20.60	-.91	-4.40	20.30	-1.21	-5.98	.30	1.47
SHOULDER-ELBOW LTH	38.81	38.30	-.51	-1.34	38.17	-.68	-1.77	.18	.43
ACROMION-RADIALE L	35.77	35.18	-.59	-1.67	35.03	-.74	-2.12	.15	.43
ELBOW-WRIST LENGTH	32.36	31.83	-.53	-1.65	31.79	-.57	-1.79	.04	.13
RADIALE-STYLION LH	29.24	28.70	-.54	-1.87	28.62	-.62	-2.18	.09	.30
ELBOW-GRIP LENGTH	37.92	37.30	-.62	-1.65	37.28	-.64	-1.71	.02	.05
THUMB-TIP REACH	87.07	85.51	-1.56	-1.83	85.13	-1.94	-2.28	.38	.44
THUMB-TIP RCH/XTD	97.29	95.16	-2.13	-2.24	94.70	-2.59	-2.73	.46	.48
SLEEVE INSEAM	52.84	51.40	-1.44	-2.80	51.33	-1.51	-2.95	.07	.14
BIACROMIAL BREADTH	43.84	42.71	-1.13	-2.65	42.56	-1.28	-3.02	.15	.36
BIDELTOID BREADTH	52.61	51.70	-.91	-1.76	51.50	-1.11	-2.15	.20	.38
CHEST BREADTH	36.49	35.37	-1.12	-3.16	35.28	-1.21	-3.44	.09	.26
WAIST BRDTH-OMPH'N	35.02	34.25	-.77	-2.24	34.12	-.90	-2.64	.13	.39
BICRISTALE BREADTH	31.23	30.37	-.86	-2.82	30.21	-1.02	-3.34	.17	.55
HIP BREADTH	38.47	38.14	-.33	-.86	37.92	-.55	-1.45	.22	.58
HIP BREADTH SITT'G	41.76	41.38	-.38	-.93	41.06	-.70	-1.71	.32	.78
ELBOW BRDTH BONE/R	7.68	7.49	-.19	-2.57	7.44	-.24	-3.20	.05	.61
ELBOW BRDTH BONE/L	7.67	7.49	-.18	-2.43	7.46	-.21	-2.87	.03	.42
F'ARM-F'ARM BR'DTH	60.68	58.58	-2.10	-3.58	58.33	-2.35	-4.03	.25	.43
KNEE BR'DTH BONE/R	10.74	10.58	-.16	-1.55	10.53	-.21	-1.99	.05	.43
KNEE BR'DTH BONE/L	10.73	10.56	-.17	-1.62	10.53	-.20	-1.94	.03	.32
CHEST DEPTH	27.71	26.81	-.90	-3.35	26.68	-1.03	-3.86	.13	.49
WAIST DEPTH-OMPH'N	26.11	24.83	-1.28	-5.17	24.62	-1.49	-6.06	.21	.84
BUTTOCK DEPTH	27.45	26.63	-.82	-3.07	26.44	-1.01	-3.82	.19	.73
THIGH CLEARANCE HT	18.84	18.29	-.55	-3.03	18.06	-.78	-4.33	.23	1.25
NECK CIRC -MAXIMUM	41.63	40.65	-.98	-2.41	40.39	-1.24	-3.07	.26	.66
SHOULDER CIRCUM'CE	127.63	125.87	-1.76	-1.39	125.44	-2.19	-1.75	.44	.35
CHEST CIRC AT SCYE	112.45	110.23	-2.22	-2.01	109.83	-2.62	-2.34	.40	.36
CHEST CIRCUMF'ENCE	109.42	106.64	-2.78	-2.61	106.51	-2.91	-2.73	.13	.12

TABLE 6 (cont'd)

COMPARISON OF 95TH PERCENTILE VALUES WITH LARGE-LONG SUBGROUP VALUES AND LARGE SIZE REGRESSION VALUES
1967 SURVEY OF USAF FLYING PERSONNEL *

WEIGHT IN KILOGRAMS ALL OTHER MEASURMENT VALUES IN CENTIMETERS

VARIABLE NAME	95TH PERCENTILE	LARGE LONG MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 95TH %ILE		REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 95TH %ILE		DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE	
			D	%D		D	%D	D	%D
CALF CIRCUMF/RIGHT	40.99	40.19	-.86	-1.98	39.89	-1.10	-2.75	.30	.74
CALF CIRCUMF/LEFT	40.63	39.90	-.73	-1.84	39.65	-.98	-2.48	.25	.63
ANKLE CIRCUMF"ENCE	24.57	24.06	-.51	-2.14	23.89	-.68	-2.83	.16	.67
SCYE CIRCUMFERENCE	52.98	51.75	-1.23	-2.39	51.88	-1.10	-2.11	-.14	-.27
BICEPS C-EXTEND/RT	34.69	33.62	-1.07	-3.18	33.38	-1.31	-3.93	.24	.72
BICEPS C-EXTEND/LT	34.31	33.26	-1.05	-3.15	33.02	-1.29	-3.92	.25	.74
BICEPS C-FLEXED/RT	36.60	35.56	-1.04	-2.92	35.27	-1.33	-3.78	.29	.82
BICEPS C-FLEXED/LT	35.93	34.98	-.95	-2.72	34.67	-1.26	-3.63	.31	.89
ELBOW CIR-EXTENDED	30.11	29.71	-.40	-1.36	29.52	-.59	-1.99	.18	.62
ELBOW CIRC-FLEXED	34.20	33.39	-.81	-2.42	33.18	-1.02	-3.06	.21	.62
LOWER ARM C-EXTEND	30.63	30.17	-.46	-1.52	29.98	-.65	-2.17	.19	.64
LOWER ARM C-FLEXED	32.44	31.78	-.66	-2.08	31.63	-.81	-2.56	.15	.48
WRIST CIRCUMF"ENCE	19.23	18.73	-.50	-2.66	18.58	-.65	-3.51	.15	.83
SLVE L/SPINE-SCYE	31.46	30.45	-1.01	-3.31	30.15	-1.31	-4.34	.30	.99
SLVE L/SPINE-ELBOW	65.03	64.62	-.41	-.63	64.14	-.89	-1.39	.48	.75
SLVE L/SPINE-WRIST	96.78	96.56	-.22	-.23	96.09	-.69	-.72	.47	.49
ANTERIOR NECK LGTH	11.05	8.55	-2.50	-29.29	8.58	-2.47	-28.82	-.03	-.36
POSTERIOR NECK LTH	16.14	13.64	-2.50	-18.37	13.52	-2.62	-19.35	.11	.92
SHOULDER LENGTH	18.76	17.64	-1.12	-6.37	17.48	-1.28	-7.34	.16	.90
DELTOID ARC	18.26	17.23	-1.03	-6.01	16.98	-1.28	-7.52	.24	1.41
INTERSCYE	44.97	40.85	-4.12	-10.68	41.04	-3.93	-9.58	-.19	-.46
INTERSCYE MAXIMUM	66.55	65.57	-.98	-1.49	65.39	-1.16	-1.77	.18	.27
WAIST FRONT-OMPH"N	44.18	43.65	-.53	-1.22	42.84	-1.33	-3.02	.76	1.75
CROTCH LGTH-OMPH"N	78.22	76.87	-1.35	-1.75	76.33	-1.89	-2.47	.54	.71
WAIST BACK-OMPHL"N	50.93	49.87	-1.06	-2.13	49.57	-1.36	-2.73	.29	.59
FOOT LENGTH	29.05	28.68	-.37	-1.29	28.56	-.49	-1.72	.12	.42
INSTEP LENGTH	21.37	21.02	-.35	-1.65	20.91	-.46	-2.21	.12	.55
FOOT BREADTH	10.61	10.31	-.30	-2.92	10.26	-.35	-3.41	.05	.48
BALL-OF-FOOT CIRC	26.98	26.27	-.71	-2.70	26.24	-.74	-2.82	.03	.12
INSTEP CIRCUMF"NCE	27.80	27.32	-.48	-1.76	27.19	-.61	-2.25	.13	.48
HEEL CIRCUMFERENCE	36.31	36.15	-.16	-.44	36.02	-.29	-.80	.13	.36
BI-MALLEOLAR BRDTH	7.98	7.74	-.24	-3.09	7.74	-.24	-3.11	.00	.02
LAT"L MALLEOLUS HT	7.95	7.54	-.41	-5.39	7.51	-.44	-5.80	.03	.38
MED"L MALLEOLUS HT	9.51	9.04	-.47	-5.21	9.05	-.46	-5.12	-.01	-.09
HAND LENGTH	20.50	20.07	-.43	-2.14	20.06	-.44	-2.22	.02	.08
PALM LENGTH	11.75	11.34	-.41	-3.62	11.35	-.40	-3.53	-.01	-.09
HAND BR/METACARPLE	9.61	9.40	-.21	-2.28	9.30	-.31	-3.29	.09	.98
HAND BRTH AT THUMB	11.03	10.75	-.28	-2.59	10.70	-.33	-3.12	.05	.51
HAND C/METACARPALE	23.14	22.67	-.47	-2.07	22.54	-.60	-2.68	.13	.59
HAND C ROUND THUMB	27.61	27.14	-.47	-1.72	27.01	-.60	-2.22	.13	.48
HAND THICK/META-3	3.12	2.88	-.24	-8.21	2.87	-.25	-8.56	.01	.33
HEAD CIRCUMFERENCE	59.93	58.69	-1.24	-2.11	58.66	-1.27	-2.16	.03	.05
SAGITTAL ARC/INION	37.36	35.26	-2.10	-5.97	35.18	-2.18	-6.21	.08	.22
MINIMUM FRONTL ARC	14.91	13.85	-1.06	-7.64	13.84	-1.07	-7.70	.01	.05
BITRAGION-CORONAL	37.84	36.58	-1.26	-3.43	36.56	-1.28	-3.49	.02	.05
BITRAGN-MIN FRNTAL	32.46	31.36	-1.10	-3.52	31.51	-.95	-3.00	-.16	-.50
BITRAG"N-SUBNASALE	30.99	30.07	-.92	-3.06	30.13	-.86	-2.84	-.06	-.22
BITRAGION-MENTON	34.71	33.85	-.86	-2.54	33.86	-.85	-2.52	-.01	-.02
BIT-SUBMANDIBULAR	33.60	32.48	-1.12	-3.44	32.44	-1.16	-3.57	.04	.13
BITRAG"N-POSTERIOR	32.11	30.52	-1.59	-5.21	30.25	-1.86	-6.16	.27	.89
HEAD LENGTH	21.00	20.30	-.70	-3.44	20.26	-.74	-3.66	.04	.21
HEAD DIAGNL/MENTON	26.89	26.27	-.62	-2.36	26.26	-.63	-2.39	.01	.03
HD DIAG/INION-NOSE	23.55	22.45	-1.10	-4.90	22.46	-1.09	-4.86	-.01	-.04
EAR BREADTH	4.31	3.92	-.39	-10.01	3.91	-.40	-10.19	.01	.16
EAR LENGTH	7.32	6.88	-.44	-6.38	6.85	-.47	-6.93	.04	.52
EAR L ABVE TRAGION	3.45	3.02	-.43	-14.28	3.01	-.44	-14.66	.01	.33
HEAD BREADTH	16.52	15.93	-.59	-3.70	15.87	-.65	-4.07	.06	.36
MAXIMUM FRONTAL BR	12.37	11.83	-.54	-4.55	11.86	-.51	-4.30	-.03	-.24
BITRAGION BREADTH	15.18	14.62	-.56	-3.82	14.63	-.55	-3.79	-.00	-.03
BIZYGOMATIC BR"DTH	15.09	14.61	-.48	-3.27	14.61	-.48	-3.29	.00	.02

* TOTAL GROUP N = 2420, LARGE LONG SUBGROUP N = 90

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TABLE 6 (concl'd)

COMPARISON OF 95TH PERCENTILE VALUES WITH LARGE-LONG SUBGROUP VALUES AND LARGE SIZE REGRESSION VALUES
1967 SURVEY OF USAF FLYING PERSONNEL *

WEIGHT IN KILOGRAMS ALL OTHER MEASUMENT VALUES IN CENTIMETERS

VARIABLE NAME	95TH PERCENTILE	LARGE LONG MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 95TH XILE D	XD	REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 95TH XILE D	XD	DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE D	XD
WAIST CIR-OMPHAL"N	100.03	97.55	-2.48	-2.54	96.92	-3.11	-3.21	.62	.64
WAIST CIR-OMPH/SIT	100.16	96.78	-3.38	-3.49	96.26	-3.90	-4.35	.52	.54
BUTTOCK CIRCUMF"CE	107.85	107.50	-.35	-.32	106.81	-1.04	-.97	.69	.64
BUTTOCK CIRCUM/SIT	119.29	118.18	-1.11	-.94	117.20	-2.09	-1.78	.98	.83
VERTICAL TRUNK CIR	180.32	181.59	1.27	.70	179.91	-.41	-.23	1.68	.93
VERT TRUNK CIR/SIT	173.20	173.33	.13	.08	172.34	-.86	-.50	.99	.57
SCROTALE-ANT WAIST	31.95	30.72	-1.23	-4.00	30.47	-1.48	-4.85	.25	.81
SCROTALE-A WAIST/S	28.31	27.01	-1.30	-4.81	26.94	-1.37	-5.10	.07	.28
SCRTL-SUPRASTERNLE	74.69	74.57	-.12	-.16	73.47	-1.22	-1.67	1.10	1.48
SCRTL-SUPRSTRNLE/S	68.62	68.11	-.51	-.75	67.29	-1.33	-1.97	.82	1.20
SCRTL-ANT SCYE LVL	59.26	58.71	-.55	-.93	57.66	-1.60	-2.78	1.06	1.80
SCRTL-ANT SCYE L/S	53.49	52.17	-1.32	-2.52	51.38	-2.11	-4.10	.79	1.51
SCRTL-A MIDSHOULDR	83.72	83.81	.09	.11	82.76	-.96	-1.16	1.05	1.26
SCRTL-A MDSHLDR/S	77.86	77.44	-.42	-.54	76.77	-1.09	-1.42	.67	.87
SCROTALE-PST WAIST	40.25	38.42	-1.83	-4.77	38.39	-1.86	-4.86	.03	.08
SCRTL-WAIST OVR BK	47.74	45.74	-2.00	-4.38	45.84	-1.90	-4.14	-.11	-.23
SCROTALE-P WAIST/S	41.67	39.14	-2.53	-6.46	39.21	-2.46	-6.27	-.07	-.18
SCRTL-WAIST/BUTT/S	44.37	42.38	-1.99	-4.70	42.18	-2.19	-5.18	.19	.46
SCROTALE-CERVICALE	89.22	88.53	-.69	-.78	88.26	-.96	-1.09	.28	.31
SCROTALE-CERVCLE/S	91.02	90.17	-.85	-.94	89.92	-1.10	-1.23	.25	.29
SCRTL-PST SCYE LVL	68.09	66.80	-1.29	-1.93	66.56	-1.53	-2.29	.24	.36
SCRTL-PST SCYE L/S	70.62	69.07	-1.55	-2.24	68.52	-1.80	-2.62	.25	.36
SCRTL-P MIDSHOULDR	92.15	91.77	-.38	-.42	91.28	-.87	-.96	.49	.53
SCRTL-MDSHLD OVR B	98.45	97.78	-.67	-.68	97.42	-1.03	-1.05	.36	.37
SCRTL-P MDSHLDR/S	94.27	93.64	-.63	-.67	93.17	-1.10	-1.18	.47	.50
SCRTL-MDSHLD O B/S	96.15	95.57	-.58	-.61	95.11	-1.04	-1.09	.46	.48
UPPER THIGH CIRCUM	66.18	65.20	-.98	-1.50	64.45	-1.73	-2.69	.76	1.16
UPPER THIGH C/SIT	64.93	64.17	-.76	-1.19	63.52	-1.41	-2.22	.65	1.01
KNEE CIRCUMFERENCE	42.19	41.87	-.32	-.76	41.71	-.48	-1.15	.16	.38
KNEE CIRCUM"CE/SIT	42.96	42.71	-.25	-.58	42.46	-.50	-1.18	.25	.59
BIGONIAL BREADTH	12.91	12.14	-.77	-6.35	12.15	-.76	-6.25	-.01	-.10
EAR-TO-EAR BREADTH	20.20	19.38	-.82	-4.23	19.27	-.93	-4.82	.11	.57
BIOCULAR BREADTH	10.01	9.30	-.71	-7.65	9.34	-.67	-7.13	-.04	-.48
INTERPUPILLARY BRD	6.88	6.36	-.52	-8.13	6.40	-.48	-7.45	-.04	-.67
INTEROCULAR BR"DTH	3.80	3.37	-.43	-12.83	3.41	-.39	-11.39	-.04	-1.29
NOSE BREADTH	4.05	3.65	-.40	-11.06	3.62	-.43	-11.78	.02	.64
LIP LENGTH	5.84	5.40	-.44	-8.21	5.34	-.50	-9.36	.05	.99
EAR PROTRUSION	2.76	2.25	-.51	-22.73	2.24	-.52	-23.03	.01	.24
SUBNASALE-NASAL RT	5.74	5.22	-.52	-9.07	5.26	-.48	-9.04	-.04	-.76
PHILTRUM LENGTH	2.03	1.58	-.45	-28.56	1.61	-.42	-26.46	-.03	-1.74
LIP-TO-LIP LENGTH	2.33	1.70	-.63	-36.70	1.72	-.61	-35.08	-.02	-1.20
MENTON-SUBNASALE L	7.78	6.97	-.81	-11.67	7.10	-.68	-9.56	-.13	-1.93
MENTON-NASAL ROOT	13.03	12.20	-.83	-6.76	12.38	-.65	-5.29	-.17	-1.40
GLABELLA-TO-VERTEX	10.90	9.48	-1.42	-15.01	9.40	-1.50	-16.01	.08	.86
NASAL ROOT-TO-VRTX	12.33	11.06	-1.27	-11.49	10.99	-1.34	-12.18	.07	.61
XTRNL CANTHUS-VRTX	13.25	12.23	-1.02	-8.35	12.19	-1.06	-8.69	.04	.31
PRONASALE-TO-VRTX	16.61	15.12	-1.49	-9.84	15.03	-1.58	-10.50	.09	.60
SUBNASALE-TO-VRTX	17.79	16.49	-1.30	-7.88	16.44	-1.35	-8.23	.05	.33
STOMION-TO-VERTEX	20.03	18.74	-1.29	-6.90	18.74	-1.29	-6.87	-.01	-.03
MENTON-TO-VERTEX	24.45	23.25	-1.20	-5.15	23.28	-1.17	-5.01	-.03	-.13
TRAGION-TO-VERTEX	14.45	13.70	-.75	-5.46	13.69	-.76	-5.53	.01	.07
GLABELLA-TO-WALL	21.48	20.78	-.70	-3.36	20.76	-.72	-3.45	.02	.09
NASAL ROOT-TO-WALL	21.28	20.56	-.72	-3.51	20.57	-.71	-3.46	-.01	-.05
XTRNL CANTHUS-WALL	18.86	18.02	-.84	-4.64	18.08	-.78	-4.29	-.06	-.33
PRONASALE-TO-WALL	23.88	23.09	-.79	-3.41	23.15	-.73	-3.17	-.05	-.23
SUBNASALE-TO-WALL	22.26	21.39	-.87	-4.05	21.43	-.83	-3.89	-.03	-.15
LIP PROMIN"CE-WALL	22.55	21.63	-.92	-4.25	21.63	-.92	-4.26	.00	.00
CHIN PROMINCE-WALL	22.17	21.11	-1.06	-5.01	21.08	-1.09	-5.16	.03	.14
TRAGION-TO-WALL	11.43	10.52	-.91	-8.65	10.49	-.94	-8.91	.03	.24

* TOTAL GROUP N = 2420, LARGE LONG SUBGROUP N = 90

TABLE 7

COMPARISON OF 5TH PERCENTILE VALUES WITH SMALL-SHORT SUBGROUP VALUES AND SMALL SIZE REGRESSION VALUES
1968 SURVEY OF AIR FORCE WOMEN *

WEIGHT IN KILOGRAMS ALL OTHER MEASURMENT VALUES IN CENTIMETERS

VARIABLE NAME	5TH PERCENTILE	SMALL SHORT MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 5TH XILE		REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 5TH XILE		DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE	
			D	XD		D	XD	D	XD
WEIGHT	46.40	45.69	-.71	-1.55	46.40	0.00	0.00	-.71	-1.55
STATURE	152.37	151.46	-.91	-.60	152.37	0.00	0.00	-.91	-.60
AGE	18.05	22.84	4.79	20.97	21.78	3.73	17.13	1.06	4.63
STATURE, MAXIMUM	152.94	152.02	-.92	-.60	152.99	.05	.04	-.97	-.64
CERVICALE HEIGHT	130.30	129.66	-.64	-.50	130.35	.05	.04	-.70	-.54
ACROMIAL HEIGHT	123.02	122.29	-.73	-.59	123.14	.12	.10	-.84	-.69
SUPRASTERNALE HGHT	123.43	122.56	-.87	-.71	123.47	.04	.04	-.92	-.75
BUST POINT HEIGHT	110.04	109.71	-.33	-.30	110.66	.62	.56	-.94	-.86
WAIST HEIGHT	93.06	92.87	-.19	-.21	93.58	.52	.55	-.71	-.78
ABDOMINAL EXT HGT	86.06	86.27	.21	.24	86.91	.85	.97	-.84	-.74
TROCHANTERIC HGHT	75.72	76.01	.29	.38	76.75	1.03	1.35	-.75	-.99
BUTTOCK HEIGHT	75.43	75.88	.45	.60	76.43	1.00	1.31	-.55	-.72
GLUTEAL FURROW HGT	66.44	66.95	.51	.77	67.66	1.22	1.81	-.71	-1.06
TIBIALE HEIGHT	38.24	38.72	.48	1.24	38.98	.74	1.89	-.26	-.66
CROTCH HEIGHT	68.13	68.57	.44	.65	69.04	.91	1.31	-.46	-.68
ANKLE HEIGHT	9.15	10.54	1.39	13.21	10.52	1.37	13.04	.02	.20
LAT'L MALLEOLUS HT	5.80	6.39	.59	9.25	6.36	.56	8.78	.03	.52
SITTING HT,RELAXED	78.91	79.73	.82	1.03	80.05	1.14	1.43	-.32	-.40
SITTING HEIGHT	80.43	80.87	.44	.54	81.33	.90	1.11	-.46	-.57
EYE HEIGHT,SITTING	68.72	69.64	.92	1.32	69.90	1.18	1.69	-.26	-.37
MIDSHOULDER HT,SIT	53.73	54.25	.52	.96	54.64	.91	1.66	-.38	-.71
WAIST HGHT,SITTING	20.46	21.72	1.26	5.78	21.97	1.51	6.86	-.25	-1.16
ELBOW REST HEIGHT	18.71	21.62	2.91	13.46	21.78	3.07	14.09	-.16	-.73
POPLITEAL HEIGHT	37.96	38.78	.82	2.13	38.88	.92	2.37	-.10	-.25
BUTTOCK-POPLIT'L L	43.45	43.96	.51	1.16	44.25	.80	1.81	-.29	-.67
BUTTOCK-KNEE LNGTH	53.24	52.82	-.42	-.79	53.47	.23	.44	-.65	-1.23
ACROMION-RADIALE L	28.32	29.02	.70	2.40	29.02	.70	2.40	.00	.01
RADIALE-STYLION L	21.15	21.89	.74	3.39	21.88	.73	3.36	.01	.04
THUMB-TIP REACH	67.67	69.63	1.96	2.81	69.76	2.09	3.00	-.14	-.20
THUMB-TIP,EXTENDED	76.01	78.35	2.34	2.98	78.58	2.57	3.26	-.23	-.29
OVERHEAD REACH	185.19	185.53	.34	.18	187.17	1.98	1.06	-1.67	-.88
NECK CIRCUMFERENCE	31.08	32.44	1.36	4.18	32.26	1.18	3.66	.17	.54
SHOULDER CIRCUMFER	92.62	93.78	1.16	1.23	94.60	1.98	2.10	-.87	-.88
CHEST CIRC AT SCYE	76.96	78.44	1.48	1.89	79.02	2.06	2.63	-.58	-.73
BUST CIRCUMFERENCE	81.61	83.86	2.25	2.69	83.96	2.35	2.80	-.10	-.12
CHEST C BELOW BUST	67.23	68.90	1.67	2.42	69.27	2.04	2.95	-.38	-.55
WAIST CIRCUMFERNCE	59.50	61.00	1.50	2.46	61.41	1.91	3.11	-.41	-.56
ABDOMINAL EXT CIRC	74.87	77.06	2.23	2.89	78.42	3.59	4.58	-1.36	-1.76
HIP C-7"BLW WAIST	85.15	85.45	.35	.41	86.90	1.80	2.07	-1.45	-1.69
HIP C-9"BLW WAIST	85.84	86.42	.58	.67	88.01	2.17	2.47	-1.60	-1.85
UPPER THIGH CIRCUM	48.74	50.07	1.33	2.66	51.01	2.27	4.45	-.94	-1.87
KNEE CIRCUMFERENCE	32.83	33.07	.24	.73	33.63	.80	2.39	-.56	-1.70
CALF CIRCUM, RIGHT	30.60	31.34	.74	2.35	31.87	1.27	3.98	-.53	-1.70
CALF CIRCUM, LEFT	30.57	31.27	.70	2.25	31.92	1.35	4.23	-.65	-2.07
ANKLE CIRCUMFERNCE	19.04	19.58	.54	2.74	19.98	.94	4.22	-.30	-1.35
VERTICAL TRUNK CIR	143.54	143.84	.30	.21	144.72	1.18	.81	-.88	-.61
VERTICAL TRK C,SIT	139.42	139.66	.24	.17	140.64	1.22	.87	-.98	-.70
BUTTOCK CIRC, SIT	90.95	91.25	.40	.44	92.41	1.56	1.69	-1.16	-1.27
SCYE CIRCUMFERENCE	33.62	34.27	.65	1.90	34.55	.93	2.69	-.28	-.82
AXILLARY ARM CIRC	23.89	24.89	1.00	4.01	25.33	1.44	5.70	-.44	-1.79
BICEPS C,RELAXED,R	22.23	23.20	.97	4.19	23.59	1.36	5.77	-.39	-1.67
BICEPS C,FLEXED, R	23.31	24.32	1.01	4.15	24.69	1.38	5.59	-.37	-1.52
BICEPS C,RELAXED,L	22.09	23.11	1.02	4.42	23.55	1.46	6.18	-.43	-1.87
BICEPS C,FLEXED, L	23.00	24.03	1.03	4.27	24.39	1.39	5.72	-.37	-1.53
ELBOW CIRC, FLEXED	24.15	24.83	.68	2.75	25.22	1.07	4.25	-.39	-1.56
FOREARM C, RELAXED	21.29	21.63	.34	1.59	21.99	.70	3.19	-.36	-1.65
FOREARM C, FLEXED	22.55	23.10	.55	2.37	23.38	.83	3.54	-.28	-1.21
WRIST CIRCUMFERNCE	13.79	14.13	.34	2.45	14.18	.39	2.76	-.05	-.33
BIACROMIAL BREADTH	33.18	34.02	.84	2.47	34.26	1.08	3.15	-.24	-.70
BIDELTOID BREADTH	38.22	38.92	.60	1.54	39.42	1.20	3.04	-.65	-1.55

* TOTAL GROUP N = 1905, SMALL SHORT SUBGROUP N = 59

TABLE 7 (cont'd)

COMPARISON OF 5TH PERCENTILE VALUES WITH SMALL-SHORT SUBGROUP VALUES AND SMALL SIZE REGRESSION VALUES
1968 SURVEY OF AIR FORCE WOMEN *

WEIGHT IN KILOGRAMS ALL OTHER MEASURMENT VALUES IN CENTIMETERS

VARIABLE NAME	5TH PERCENTILE	SMALL SHORT MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 5TH XILE		REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 5TH XILE		DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE	
			D	%D		D	%D	D	%D
CHEST BREADTH	25.08	25.90	.82	3.17	26.18	1.10	4.21	-.28	-1.09
BUST PT-BUST PT BR	16.07	17.38	1.31	7.54	17.35	1.28	7.36	.03	.19
WAIST BREADTH	21.22	21.93	.71	3.25	22.07	.85	3.84	-.13	-.61
HIP BREADTH	31.55	32.04	.49	1.54	32.55	1.00	3.09	-.51	-.61
THIGH-THIGH BR,SIT	33.84	34.64	.80	2.31	35.40	1.56	4.40	-.76	-2.19
HUMERAL BREADTH, R	5.64	5.77	.13	2.22	5.82	.18	3.01	-.05	-.82
HUMERAL BREADTH, L	5.60	5.73	.13	2.22	5.79	.19	3.20	-.06	-1.01
FEMORAL BREADTH, R	7.38	7.78	.40	5.14	7.74	.36	4.71	.04	.45
FEMORAL BREADTH, L	7.43	7.77	.34	4.35	7.76	.33	4.31	.00	.04
CHEST DEPTH	20.85	21.90	1.05	4.81	21.85	1.00	4.59	.05	.23
WAIST DEPTH	14.76	15.43	.67	4.31	15.54	.78	5.03	-.12	-.75
ABDOMINAL EXT DPTH	17.92	18.74	.82	4.36	18.88	.96	5.10	-.14	-.76
BUTTOCK DEPTH	18.41	18.99	.58	3.07	19.37	.96	4.97	-.38	-2.00
THIGH CLEARANCE	10.42	10.89	.47	4.34	11.02	.60	5.42	-.12	-1.14
SHOULDER LENGTH	12.98	13.85	.87	6.30	13.98	1.00	7.18	-.13	-.95
NECK-BUST POINT L	22.52	24.13	1.61	6.67	23.95	1.43	5.98	.18	.74
STRAP LENGTH	59.17	61.76	2.59	4.20	61.47	2.30	3.73	.39	.48
INTERSCYE	31.16	33.19	2.03	6.11	33.36	2.20	6.60	-.17	-.53
INTERSCYE, MAXIMUM	43.90	46.07	2.17	4.72	46.44	2.54	5.47	-.36	-.79
BACK CURVATURE	37.57	39.37	1.80	4.58	39.66	2.09	5.27	-.29	-.73
WAIST BACK	36.95	38.33	1.38	3.60	38.43	1.48	3.86	-.10	-.27
ANTERIOR WAIST LTH	30.49	31.57	1.08	3.43	31.75	1.26	3.96	-.18	-.56
SLEEVE INSEAM	40.23	41.37	1.14	2.76	41.55	1.32	3.18	-.18	-.43
SPINE-TO-SCYE LGTH	18.25	19.65	1.40	7.13	19.44	1.19	6.12	.21	1.07
SPINE-TO-ELBOW LTH	49.43	49.97	.54	1.08	50.22	.79	1.57	-.25	-.50
SPINE-TO-WRIST LTH	74.18	74.63	.45	.61	75.02	.84	1.12	-.39	-.52
HAND LENGTH	16.90	17.36	.46	2.67	17.39	.49	2.84	-.03	-.17
HAND BREADTH	6.92	7.25	.33	4.54	7.24	.32	4.41	.01	.13
HAND CIRCUMFERENCE	16.81	17.51	.70	3.97	17.54	.73	4.15	-.03	-.18
FOOT LENGTH	22.19	22.46	.27	1.21	22.66	.47	2.08	-.20	-.89
FOOT BREADTH	8.02	8.42	.40	4.75	8.49	.47	5.54	-.07	-.83
HEAD LENGTH	17.27	17.91	.64	3.56	17.98	.71	3.94	-.07	-.83
HEAD BREADTH	13.54	14.26	.72	5.02	14.27	.73	5.10	-.07	-.40
HEAD CIRCUMFERENCE	52.25	53.36	1.11	2.09	53.66	1.41	2.64	-.01	-.08
TRAGION-TOP HEAD	11.56	12.42	.86	6.83	12.36	.80	6.47	.06	.45
ECTOCANTHUS-TOP HD	10.36	11.36	1.00	8.78	11.38	1.02	8.96	-.02	-.19
PRONASALE-TOP HEAD	12.92	14.33	1.41	9.82	14.29	1.37	9.56	.04	.28
SUBNASALE-TOP HEAD	14.17	15.34	1.17	7.60	15.37	1.20	7.82	-.04	-.23
STOMION-TOP HEAD	16.05	17.29	1.24	7.15	17.26	1.21	7.02	.02	.14
MENTON-TOP HEAD	20.09	21.14	1.05	4.99	21.16	1.07	5.06	-.02	-.08
TRAGION TO WALL	8.87	9.82	.95	9.69	9.82	.95	9.72	-.00	-.03
ECTOCANTHUS-WALL	14.93	15.82	.89	5.61	15.85	.92	5.78	-.03	-.18
PRONASALE TO WALL	19.72	20.56	.84	4.09	20.58	.86	4.20	-.02	-.12
SUBNASALE TO WALL	18.18	19.13	.95	4.95	19.13	.95	4.97	-.00	-.02
LIP PROTRUS"N-WALL	17.72	18.85	1.13	5.98	18.85	1.13	5.98	-.00	-.00
MENTON TO WALL	16.49	17.84	1.35	7.55	17.79	1.30	7.28	.05	.29
SAGITTAL CURVATURE	32.41	34.01	1.60	4.70	33.99	1.58	4.66	.02	.05
BITRAGION-CORONAL	31.65	33.28	1.63	4.91	33.15	1.50	4.52	.13	.40
BIOCULAR BREADTH	8.87	9.46	.59	6.21	9.46	.59	6.25	-.00	-.04
BIAURICULAR BRDTH	14.24	15.51	1.27	8.17	15.49	1.25	8.04	.02	.14
BITRAGION BREADTH	12.09	12.61	.52	4.15	12.58	.49	3.92	.03	.24
BIZYGOMATIC BRDTH	11.91	12.66	.75	5.89	12.58	.67	5.34	.07	.58
BIGONIAL BREADTH	9.26	10.04	.78	7.81	9.92	.66	6.65	.12	1.24
NASAL BREADTH	2.68	3.16	.48	15.26	3.15	.47	14.98	.01	.33
LIP LENGTH	3.70	4.34	.64	14.76	4.32	.62	14.30	.02	.53
MENTON-SUBNASALE L	4.70	5.34	.64	11.97	5.34	.64	11.97	.00	.00
MENTON-SELLION LTH	9.63	10.38	.75	7.25	10.30	.67	6.48	.09	.83
SUBNASALE-SELLION	3.88	4.43	.55	12.43	4.40	.52	11.86	.03	.65
EAR LENGTH	4.49	4.99	.50	10.02	5.04	.55	10.85	-.05	-.93
EAR BREADTH	2.41	2.85	.44	15.51	2.90	.49	16.89	-.05	-1.66

* TOTAL GROUP N = 1905, SMALL SHORT SUBGROUP N = 59

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TABLE 8

COMPARISON OF 95TH PERCENTILE VALUES WITH LARGE-LONG SUBGROUP VALUES AND LARGE SIZE REGRESSION VALUES
1968 SURVEY OF AIR FORCE WOMEN *

WEIGHT IN KILOGRAMS ALL OTHER MEASURMENT VALUES IN CENTIMETERS

VARIABLE NAME	95TH PERCENTILE	LARGE LONG MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 95TH XILE		REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 95TH XILE		DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE	
			D	%D		D	%D	D	%D
WEIGHT	70.93	72.88	1.95	2.67	70.93	0.00	0.00	1.95	2.67
STATURE	172.15	172.69	.54	.31	172.15	0.00	0.00	.54	.31
AGE	38.63	26.32	-12.31	-46.78	25.48	-13.15	-51.60	.84	3.18
STATURE, MAXIMUM	172.82	173.42	.60	.35	172.82	-.00	-.00	.61	.35
CERVICALE HEIGHT	148.41	148.97	.56	.37	148.35	-.06	-.04	.61	.41
ACROMIAL HEIGHT	141.10	141.50	.40	.28	140.93	-.17	-.12	.57	.40
SUPRASTERNALE HGHT	140.92	141.48	.56	.40	140.85	-.07	-.05	.63	.45
BUST POINT HEIGHT	127.29	126.56	-.73	-.58	126.18	-1.11	-.88	.38	.30
WAIST HEIGHT	107.88	107.71	-.17	-.16	107.21	-.67	-.62	.50	.46
ABDOMINAL EXT HGT	100.72	100.00	-.72	-.72	99.54	-1.18	-1.18	.46	.46
TROCHANTERIC HGHT	89.82	89.33	-.49	-.55	88.79	-1.03	-1.16	.54	.60
BUTTOCK HEIGHT	89.18	88.90	-.28	-.31	88.20	-.98	-1.11	.79	.79
GLUTEAL FURROW HGT	79.40	78.59	-.81	-1.03	77.82	-1.58	-2.03	.77	.98
TIBIALE HEIGHT	46.09	45.66	-.43	-.95	45.08	-1.01	-2.24	.58	1.27
CROTCH HEIGHT	81.38	80.85	-.53	-.65	80.12	-1.26	-1.57	.73	.90
ANKLE HEIGHT	13.62	12.05	-1.57	-13.03	11.87	-1.75	-14.72	.18	1.48
LAT'L MALLEOLUS HT	7.82	7.25	-.57	-7.91	7.21	-.61	-8.52	.04	.56
SITTING HT,RELAXED	89.67	88.61	-1.06	-1.20	88.67	-1.00	-1.12	-.06	-.07
SITTING HEIGHT	90.89	90.17	-.72	-.80	90.06	-.83	-.93	.11	.12
EYE HEIGHT,SITTING	78.82	77.80	-1.02	-1.31	77.68	-1.14	-1.47	.12	.16
MIDSHOULDER HT,SIT	62.52	61.54	-.98	-1.59	61.55	-.97	-1.57	-.01	-.02
WAIST HGHT,SITTING	26.24	24.80	-1.44	-5.83	24.90	-1.34	-5.39	-.10	-.41
FLBOW REST HEIGHT	26.90	23.20	-3.70	-15.93	23.70	-3.20	-13.51	-.50	-2.14
POPLITEAL HEIGHT	44.11	43.75	-.36	-.83	43.27	-.84	-1.93	.47	1.08
BUTTOCK-POPLIT'L L	52.58	51.85	-.73	-1.40	51.45	-1.13	-2.20	.41	.78
BUTTOCK-KNEE LNGTH	61.91	61.93	.02	.04	61.72	-.19	-.31	.21	.35
ACROMION-RADIALE L	33.64	33.30	-.34	-1.01	33.09	-.55	-1.67	.22	.65
RADIALE-STYLION L	25.73	25.07	-.66	-2.65	24.95	-.78	-3.14	.12	.47
THUMB-TIP REACH	80.45	78.70	-1.75	-2.22	78.74	-1.71	-2.18	-.03	-.04
THUMB-TIP,EXTENDED	92.27	89.36	-2.91	-3.26	89.39	-2.88	-3.22	-.03	-.04
OVERHEAD REACH	213.28	211.83	-1.45	-.68	211.75	-1.53	-.72	.08	.04
NECK CIRCUMFERENCE	36.66	35.77	-.89	-2.48	35.48	-1.18	-3.34	.30	.83
SHOULDER CIRCUMFER	109.38	108.57	-.81	-.75	107.35	-2.03	-1.89	1.22	1.13
CHEST CIRC AT SCYE	93.23	91.91	-1.32	-1.44	90.54	-2.69	-2.97	1.37	1.49
BUST CIRCUMFERENCE	100.23	98.39	-1.84	-1.87	96.72	-3.51	-3.63	1.67	1.69
CHEST C BELOW BUST	83.08	81.61	-1.47	-1.81	80.40	-2.68	-3.33	1.20	1.47
WAIST CIRCUMFERNCE	77.24	75.88	-1.36	-1.79	74.21	-3.03	-4.08	1.67	2.20
ABDOMINAL EXT CIRC	98.60	95.45	-3.15	-3.30	94.45	-4.15	-4.40	1.00	1.05
HIP C-7""BLW WAIST	103.33	101.76	-1.57	-1.54	101.68	-1.65	-1.62	.08	.08
HIP C-9""BLW WAIST	105.63	103.73	-1.90	-1.64	103.92	-1.71	-1.64	-.20	-.19
UPPER THIGH CIRCUM	62.61	61.03	-1.58	-2.59	60.90	-1.71	-2.80	.13	.21
KNEE CIRCUMFERENCE	40.24	39.60	-.64	-1.63	39.44	-.80	-2.03	.16	.39
CALF CIRCUM, RIGHT	37.94	36.65	-1.29	-3.52	36.87	-1.07	-2.92	-.22	-.59
CALF CIRCUM, LEFT	38.07	36.94	-1.13	-3.35	36.99	-1.08	-2.92	-.15	-.42
ANKLE CIRCUMFERNCE	23.34	22.35	-.99	-4.44	22.47	-.87	-3.85	-.13	-.57
VERTICAL TRUNK CIR	166.29	165.68	-.61	-.37	165.32	-.97	-.59	.36	.22
VERTICAL TRK C,SIT	161.00	160.43	-.57	-.35	160.48	-.52	-.33	-.04	-.03
BUTTOCK CIRC, SIT	110.79	109.31	-1.48	-1.36	109.02	-1.77	-1.60	.29	.27
SCYE CIRCUMFERENCE	41.08	40.30	-.78	-1.94	40.10	-.98	-2.45	.20	.50
AXILLARY ARM CIRC	31.50	30.55	-.95	-3.11	30.07	-1.43	-4.76	.48	1.57
BICEPS C,RELAXED,R	29.65	28.52	-1.13	-3.99	28.16	-1.49	-5.29	.36	1.24
BICEPS C,FLEXED, R	30.76	29.74	-1.04	-3.50	29.43	-1.35	-4.66	.31	1.34
BICEPS C,RELAXED,L	29.90	28.67	-1.23	-4.29	28.34	-1.56	-5.51	.33	1.16
BICEPS C,FLEXED, L	30.72	29.50	-1.22	-4.15	29.23	-1.49	-5.10	.27	.91
ELBOW CIRC, FLEXED	30.02	29.02	-1.00	-3.46	28.96	-1.06	-3.66	.05	.19
FOREARM C, RELAXED	25.76	25.48	-.28	-1.12	25.26	-.50	-2.00	.22	.47
FOREARM C, FLEXED	27.53	27.06	-.47	-1.74	26.89	-.65	-2.41	.18	.65
WRIST CIRCUMFERNCE	16.21	15.95	-.26	-1.62	15.85	-.36	-2.27	.10	.64
BIACROMIAL BREADTH	38.58	37.94	-.64	-1.68	37.59	-.99	-2.63	.35	.92
BIDELTOID BREADTH	45.85	45.20	-.65	-1.44	44.82	-1.03	-2.31	.34	.75

* TOTAL GROUP N = 1905, LARGE LONG SUBGROUP N = 66

TABLE 8 (cont'd)

COMPARISON OF 95TH PERCENTILE VALUES WITH LARGE-LONG SUBGROUP VALUES AND LARGE SIZE REGRESSION VALUES
1968 SURVEY OF AIR FORCE WOMEN *

WEIGHT IN KILOGRAMS ALL OTHER MEASURMENT VALUES IN CENTIMETERS

VARIABLE NAME	95TH PERCENTILE	LARGE LONG MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 95TH %ILE		REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 95TH %ILE		DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE	
			D	%D		D	%D	D	%D
CHEST BREADTH	31.40	31.54	-.86	-2.81	30.16	-1.24	-4.11	.38	1.25
BUST PT-BUST PT BR	21.18	20.15	-1.03	-5.10	19.96	-1.22	-6.11	.19	.98
WAIST BREADTH	27.55	26.99	-.56	-2.08	26.57	-.98	-3.67	.42	1.54
HIP BREADTH	38.84	37.60	-1.24	-3.31	37.82	-1.02	-2.69	-.22	-.60
THIGH-THIGH BR,SIT	43.26	41.71	-1.55	-3.72	41.59	-1.67	-4.01	.12	.28
HUMERAL BREADTH, R	6.65	6.50	-.15	-2.31	6.49	-.16	-2.51	.01	.20
HUMERAL BREADTH, L	6.60	6.48	-.12	-1.82	6.45	-.15	-2.31	.03	.48
FEMORAL BREADTH, R	8.88	8.56	-.32	-3.71	8.54	-.34	-4.01	.02	.28
FEMORAL BREADTH, L	8.89	8.58	-.31	-3.65	8.57	-.32	-3.76	.01	.11
CHEST DEPTH	27.15	26.45	-.70	-2.65	25.83	-1.32	-5.13	.62	2.36
WAIST DEPTH	20.16	19.23	-.93	-4.85	18.83	-1.33	-7.07	.40	2.07
ABDOMINAL EXT DPTH	24.80	23.73	-1.07	-4.51	23.36	-1.44	-6.15	.37	1.55
BUTTOCK DEPTH	24.31	23.41	-.90	-3.86	23.33	-.98	-4.21	.08	.34
THIGH CLEARANCE	14.59	14.26	-.33	-2.30	14.07	-.52	-3.70	.19	1.35
SHOULDER LENGTH	16.40	15.58	-.82	-5.24	15.38	-1.02	-6.62	.20	1.29
NECK-BUST POINT L	28.79	27.81	-.98	-3.53	27.31	-1.48	-5.40	.49	1.77
STRAP LENGTH	72.11	70.40	-1.71	-2.43	69.62	-2.49	-3.57	.77	1.10
INTERSCYE	39.19	37.33	-1.86	-4.99	37.10	-2.09	-5.63	.23	.60
INTERSCYE, MAXIMUM	54.71	53.62	-1.09	-2.03	52.77	-1.94	-3.67	.85	1.59
BACK CURVATURE	47.57	45.31	-1.66	-3.62	45.12	-2.45	-5.44	.79	1.72
WAIST BACK	44.28	42.47	-1.81	-4.27	42.65	-1.63	-3.83	-.18	-.42
ANTERIOR WAIST LTH	36.93	35.97	-.96	-2.67	35.58	-1.35	-3.78	.38	1.07
SLEEVE INSEAM	48.18	46.82	-1.36	-2.92	46.73	-1.45	-3.11	.09	.19
SPINE-TO-SCYE LGTH	22.71	21.62	-1.09	-5.06	21.43	-1.28	-5.97	.19	.86
SPINE-TO-ELBOW LTH	57.32	57.03	-.29	-.51	56.65	-.67	-1.18	.38	.66
SPINE-TO-WRIST LTH	85.11	85.02	-.09	-.10	84.44	-.67	-.79	.58	.68
HAND LENGTH	20.05	19.44	-.51	-2.62	19.42	-.63	-3.24	.12	.60
HAND BREADTH	8.20	7.96	-.24	-2.97	7.90	-.30	-3.77	.06	.78
HAND CIRCUMFERENCE	19.84	19.28	-.56	-2.92	19.20	-.64	-3.33	.09	.40
FOOT LENGTH	25.98	25.64	-.34	-1.31	25.57	-.41	-1.62	.09	.30
FOOT BREADTH	9.77	9.31	-.46	-4.99	9.29	-.48	-5.21	.02	.21
HEAD LENGTH	19.52	18.95	-.57	-3.02	18.88	-.64	-3.38	.07	.35
HEAD BREADTH	15.53	14.82	-.70	-4.71	14.81	-.71	-4.82	.02	.10
HEAD CIRCUMFERENCE	57.59	56.24	-1.35	-2.40	56.21	-1.38	-2.46	.03	.06
TRAGION-TOP HEAD	14.17	13.14	-.93	-7.05	13.12	-.95	-7.23	.02	.17
ECTOCANTHUS-TOP HD	13.37	12.15	-1.23	-10.05	12.17	-1.20	-9.82	-.03	-.21
PRONASALE-TOP HEAD	16.79	15.27	-1.52	-9.93	15.26	-1.53	-10.06	.02	.11
SUBNASALE-TOP HEAD	17.79	16.46	-1.33	-8.08	16.48	-1.31	-7.95	-.02	-.11
STOMION-TOP HEAD	19.72	18.42	-1.30	-7.06	18.42	-1.30	-7.07	.00	.01
MENTON-TOP HEAD	23.92	22.76	-1.06	-4.75	22.79	-1.13	-4.92	.04	.17
TRAGION TO WALL	11.79	10.65	-1.14	-10.25	10.56	-1.23	-11.67	.09	.82
ECTOCANTHUS-WALL	16.16	15.03	-.99	-5.62	16.95	-1.15	-6.69	.14	.82
PRONASALE TO WALL	22.86	21.92	-.94	-4.20	21.87	-.99	-4.55	.06	.26
SUBNASALE TO WALL	21.34	20.30	-1.04	-5.34	20.26	-1.12	-5.52	.03	.16
LIP PROTRUSION-WALL	21.16	19.44	-1.72	-6.63	19.82	-1.34	-6.76	.02	.11
MENTON TO WALL	20.19	18.97	-1.12	-6.99	18.77	-1.42	-7.55	.16	.52
SAGITTAL CURVATURE	37.39	35.56	-1.81	-5.15	35.66	-1.69	-4.74	-.14	-.39
BITRAGION-CORONAL	36.31	34.78	-1.53	-4.43	34.79	-1.52	-4.18	-.01	-.12
BIOCULAR BREADTH	10.51	9.92	-.59	-5.93	9.91	-.60	-6.06	.01	.12
BIAURICULAR BRDTH	17.17	16.43	-.94	-5.76	16.23	-1.14	-7.33	.19	1.14
BITRAGION BREADTH	13.74	13.24	-.46	-1.46	13.24	-.50	-3.76	.04	.31
BIZYGOMATIC BRDTH	13.93	13.36	-.46	-3.62	13.27	-.56	-4.25	.08	.60
BIGONIAL BREADTH	11.13	10.61	-.52	-4.88	10.50	-.63	-5.92	.11	1.03
NASAL BREADTH	3.79	3.24	-.55	-17.11	3.24	-.55	-16.81	-.01	-.16
LIP LENGTH	5.11	4.50	-.61	-13.63	4.45	-.66	-14.92	.05	1.12
MENTON-SUBNASALE L	6.53	5.75	-.64	-11.14	5.77	-.62	-10.57	-.01	-.20
MENTON-SELLION LTH	11.66	11.05	-.61	-5.45	10.99	-.67	-6.07	.06	.56
SUBNASALE-SELLION	5.24	4.73	-.51	-10.85	4.70	-.54	-11.38	.02	.43
EAR LENGTH	5.95	5.52	-.43	-7.74	5.47	-.48	-3.83	.06	1.01
EAR BREADTH	3.51	3.07	-.44	-14.14	3.07	-.44	-14.24	-.00	-.09

* TOTAL GROUP N = 1905, LARGE LONG SUBGROUP N = 60

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TABLE 9

COMPARISON OF 5TH PERCENTILE VALUES WITH SMALL-SHORT SUBGROUP VALUES AND SMALL SIZE REGRESSION VALUES
COMBINED US ARMY 1966 AND USAF 1967 SAMPLE *

WEIGHT IN KILOGRAMS ALL OTHER MEASUREMENT VALUES IN CENTIMETERS

VARIABLE NAME	5TH PERCENTILE	SMALL SHORT MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 5TH XILE		REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 5TH XILE		DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE	
			D	%D		D	%D	D	%D
HEIGHT (STATURE)	164.49	162.56	-1.93	-1.19	164.49	0.00	0.00	-1.93	-1.19
WEIGHT	58.10	56.11	-1.99	-3.55	58.10	0.00	0.00	-1.99	-3.55
ANKLE CIRCUMF"ENCE	20.46	21.01	.55	2.62	21.33	.37	4.09	-.32	-1.53
SCYE CIRCUMFERENCE	40.07	41.05	.98	2.39	41.91	1.84	4.39	-.86	-2.09
BICEPS C-FLEXED/RT	28.27	29.29	1.02	3.50	30.37	1.80	5.99	-.78	-2.65
BIDELTOID BREADTH	41.77	42.26	.49	1.16	42.93	1.16	2.71	-.65	-1.60
BUTTOCK CIRCUMF"CE	85.68	85.77	.09	.11	87.43	1.75	2.01	-1.66	-1.94
BUTTOCK-KNEE LNGTH	55.14	54.64	-.50	-.92	55.53	.39	.70	-.49	-1.64
CALF CIRCUMF/RIGHT	32.59	33.40	.61	2.43	34.17	1.58	4.62	-.77	-2.30
CALF HEIGHT	31.32	32.33	1.01	3.13	32.90	1.58	4.81	-.57	-1.70
CERVICALE HEIGHT	139.96	138.33	-1.63	-1.18	140.25	.29	.21	-1.92	-1.39
CHEST BREADTH	27.57	28.20	.63	2.22	28.69	1.12	3.91	-.50	-1.76
CHEST CIRCUMF"ENCE	84.67	86.07	1.40	1.63	87.62	2.95	3.37	-1.55	-1.80
CROTCH HEIGHT	76.80	77.69	.89	1.15	78.66	1.86	2.36	-.96	-1.24
BIZYGOMATIC BR"DTH	13.15	13.53	.38	2.84	13.66	.51	3.72	-.12	-.97
FOOT LENGTH	24.78	25.04	.26	1.03	25.28	.50	1.99	-.25	-.98
LOWER ARM C-FLEXED	26.32	27.09	.77	2.84	27.70	1.38	3.00	-.61	-2.27
HAND BR/METACARPLE	8.15	8.39	.24	2.81	8.51	.36	4.20	-.12	-1.46
HAND C/METACARPALE	19.88	20.44	.56	2.74	20.68	.80	3.86	-.24	-1.17
HAND LENGTH	17.58	17.87	.29	1.64	18.06	.48	2.66	-.19	-1.14
HEAD BREADTH	14.41	14.94	.53	3.57	15.04	.63	4.19	-.10	-.65
HEAD CIRCUMFERENCE	53.75	54.82	1.07	1.96	55.13	1.38	2.50	-.31	-.56
HEAD LENGTH	18.34	18.97	.63	3.30	19.08	.74	3.90	-.12	-.62
HIP BREADTH	30.37	30.44	.07	.22	31.02	.65	2.13	-.58	-1.92
INSTEP CIRCUMF"NCE	23.87	24.80	.93	3.75	25.12	1.25	4.99	-.33	-1.39
INSTEP LENGTH	18.00	18.37	.17	2.00	18.55	.55	2.95	-.18	-.98
INTERPUPILLARY BRD	5.51	5.98	.47	7.94	6.01	.50	8.28	-.02	-.38
INTERSCYE	33.53	36.37	2.84	7.82	37.06	3.53	9.52	-.68	-1.90
MENTON-NASAL ROOT	10.98	11.54	.56	4.85	11.66	.68	5.81	-.12	-1.04
MIDSHOULDER HT/SIT	57.61	58.37	.76	1.30	59.11	1.50	2.53	-.74	-1.27
PALM LENGTH	9.66	9.97	.31	3.12	10.09	.43	4.24	-.12	-1.15
PATELLA TOP HEIGHT	47.85	48.57	.72	1.49	49.21	1.36	2.77	-.64	-1.31
POPLITEAL HGHT/SIT	40.43	41.79	1.36	3.26	42.19	1.76	4.18	-.40	-.96
SHOULDER CIRCUM"CE	104.06	105.16	1.10	1.05	106.95	2.89	2.70	-1.79	-1.73
SHOULDER-ELBOW LTH	33.60	34.17	.57	1.65	34.67	1.09	2.89	-.44	-1.28
ACROMION HEIGHT	134.11	132.78	-1.33	-1.01	134.46	.35	.26	-1.69	-1.27
SHOULDER LENGTH	13.06	15.24	2.18	14.33	15.48	2.42	15.67	-.23	-1.53
SITTING HEIGHT	85.08	85.75	.67	.78	86.63	1.55	1.79	-.89	-1.02
SLEEVE INSEAM	44.23	45.08	.85	1.88	45.63	1.40	3.07	-.55	-1.23
UPPER THIGH CIRCUM	48.52	49.95	1.43	2.87	51.12	2.60	5.09	-1.17	-2.34
WAIST CIR-OMPHAL"N	70.13	71.68	1.55	2.17	73.06	2.93	4.01	-1.37	-1.92
ILIOCRISTALE HT	98.15	98.31	.16	.16	99.51	1.36	1.36	-1.20	-1.72

* TOTAL GROUP N = 9102, SMALL SHORT SUBGROUP N = 319

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TABLE 10

COMPARISON OF 95TH PERCENTILE VALUES WITH LARGE-LONG SUBGROUP VALUES AND LARGE SIZE REGRESSION VALUES
COMBINED US ARMY 1966 AND USAF 1967 SAMPLE *

WEIGHT IN KILOGRAMS ALL OTHER MEASURMENT VALUES IN CENTIMETERS

VARIABLE NAME	95TH PERCENTILE	LARGE LONG MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 95TH XILE		REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 95TH XILE		DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE	
			D	XD		D	XD	D	XD
HEIGHT (STATURE)	186.28	197.79	1.51	.80	186.28	0.00	0.00	1.51	.80
WEIGHT	93.27	96.26	2.99	3.11	93.27	0.00	0.00	2.99	3.11
ANKLE CIRCUMF"ENCE	25.06	24.21	-.85	-3.52	24.20	-.36	-3.57	.01	.05
SCYE CIRCUMFERENCE	51.31	50.46	-1.35	-2.67	50.12	-1.69	-3.38	.35	.69
BICEPS C-FLEXED/RT	36.91	35.67	-1.24	-3.47	35.51	-1.49	-3.94	.16	.45
BIDELTOID BREADTH	51.13	50.41	-.72	-1.42	50.12	-1.01	-2.02	.29	.58
BUTTOCK CIRCUMF"CE	106.56	106.22	-.34	-.32	105.38	-1.18	-1.12	.84	.79
BUTTOCK-KNEE LNGTH	64.51	64.78	.27	.42	64.25	-.26	-.41	.53	.83
CALF CIRCUMF/RIGHT	41.10	40.13	-.97	-2.41	40.08	-1.02	-2.54	.05	.13
CALF HEIGHT	39.80	38.40	-1.40	-3.66	38.03	-1.77	-4.66	.37	.96
CERVICALE HEIGHT	160.65	161.86	1.21	.75	160.51	-.14	-.09	1.35	.83
CHEST BREADTH	35.29	34.48	-.81	-2.35	34.26	-1.03	-3.00	.22	.63
CHEST CIRCUMF"ENCE	107.36	105.22	-2.14	-2.04	104.62	-2.74	-2.62	.59	.56
CROTCH HEIGHT	91.83	90.44	-1.39	-1.54	89.68	-2.15	-2.40	.76	.84
BIZYGOMATIC BR"DTH	14.99	14.57	-.42	-2.92	14.56	-.43	-2.97	.01	.05
FOOT LENGTH	28.99	28.65	-.34	-1.19	28.51	-.48	-1.69	.14	.49
LOWER ARM C-FLEXED	32.95	31.66	-1.09	-3.41	31.82	-1.13	-3.55	.04	.14
HAND BR/METACARPLE	9.71	9.33	-.38	-4.02	9.35	-.36	-3.90	-.01	-.11
HAND C/METACARPALE	23.45	22.70	-.75	-3.31	22.65	-.80	-3.53	.05	.21
HAND LENGTH	20.62	20.15	-.47	-2.35	20.09	-.53	-2.62	.05	.26
HEAD BREADTH	16.35	15.77	-.58	-3.71	15.75	-.60	-3.82	.02	.11
HEAD CIRCUMFERENCE	59.29	58.26	-1.03	-1.78	58.11	-1.18	-2.03	.15	.25
HEAD LENGTH	20.78	20.20	-.58	-2.88	20.13	-.65	-3.21	.06	.31
HIP BREADTH	37.52	37.36	-.16	-.42	37.06	-.46	-1.25	.31	.82
INSTEP CIRCUMF"NCE	29.15	27.85	-1.30	-4.67	27.73	-1.42	-5.11	.12	.42
INSTEP LENGTH	21.38	21.06	-.32	-1.51	20.90	-.48	-2.28	.16	.75
INTERPUPILLARY BRD	6.81	6.34	-.47	-7.42	6.35	-.46	-7.19	-.01	-.25
INTERPSCYE	44.45	41.18	-3.27	-7.93	41.51	-2.94	-7.08	-.33	-.80
MENTON-NASAL ROOT	13.11	12.39	-.72	-5.83	12.44	-.57	-5.42	-.05	-.39
MIDSHOULDER HT/SIT	68.25	67.60	-.65	-.97	67.08	-1.17	-1.74	.52	.76
PALM LENGTH	11.70	11.32	-.38	-3.40	11.26	-.44	-3.86	.05	.45
PATELLA TOP HEIGHT	58.06	56.78	-1.28	-2.25	56.39	-1.67	-2.96	.39	.69
POPLITEAL HGHT/SIT	48.56	46.85	-1.73	-3.70	46.40	-2.18	-4.71	.45	.97
SHOULDER CIRCUM"CE	125.62	124.43	-1.19	-.96	123.78	-1.86	-1.50	.66	.53
SHOULDER-ELBOW LTH	39.77	39.08	-.69	-1.77	38.69	-1.08	-2.80	.39	1.00
ACROMION HEIGHT	154.35	155.45	1.10	.71	154.05	-.30	-.20	1.41	.90
SHOULDER LENGTH	19.11	17.28	-1.83	-10.60	17.24	-1.87	-10.87	.04	.24
SITTING HEIGHT	97.41	96.84	-.57	-.59	96.28	-1.13	-1.18	.57	.58
SLEEVE INSEAM	52.96	51.94	-1.02	-1.97	51.53	-1.43	-2.78	.41	.79
UPPER THIGH CIRCUM	64.80	63.66	-1.14	-1.79	63.12	-1.68	-2.67	.55	.86
WAIST CIR-OMPHAL"N	98.09	95.41	-2.68	-2.60	94.15	-3.94	-4.18	1.26	1.32
ILIOCRISTALE HT	115.86	115.95	.09	.08	114.83	-1.03	-.90	1.12	.96

* TOTAL GROUP N = 9102, LARGE LONG SUBGROUP N = 316

TABLE 11

COMPARISON OF 5TH PERCENTILE VALUES WITH SMALL-SHORT SUBGROUP VALUES AND SMALL SIZE REGRESSION VALUES
COMBINED US ARMY 1977 AND USAF 1968 SAMPLE *

WEIGHT IN KILOGRAMS ALL OTHER MEASURMENT VALUES IN CENTIMETERS

VARIABLE NAME	5TH PERCENTILE	SMALL SHORT MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 5TH XILE		REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 5TH XILE		DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE	
			D	XD		D	XD	D	XD
WEIGHT	46.45	45.63	-.82	-.80	46.45	0.00	0.00	-.82	-1.80
STATURE	152.50	151.67	-.83	-.55	152.50	0.00	0.00	-.83	-.55
SHOULDER HEIGHT	123.30	122.83	-.47	-.38	123.43	.13	.11	-.60	-.49
BUSTPOINT HEIGHT	109.68	109.72	.04	.04	110.53	.85	.77	-.81	-.73
WAIST HEIGHT	93.13	93.32	.19	.20	93.79	.66	.71	-.47	-.51
CROTCH HEIGHT	68.55	69.46	.91	1.32	69.58	1.03	1.48	-.12	-.17
BUTTOCK HEIGHT	75.86	76.60	.74	.97	76.77	.91	1.19	-.17	-.22
SITTING HEIGHT	79.81	80.49	.68	.85	81.16	1.35	1.66	-.66	-.82
EYE HEIGHT SIT	68.31	69.33	1.02	1.47	69.81	1.50	2.15	-.48	-.69
POPITEAL HEIGHT	38.01	38.73	.72	1.86	38.73	.72	1.86	.00	.00
BUTTOCK-KNEE LTH	53.19	52.82	-.37	-.69	53.38	.19	.35	-.55	-1.04
BUST DEPTH	20.23	21.27	1.04	4.98	21.57	1.34	6.23	-.30	-1.41
WAIST DEPTH	14.93	15.88	.95	5.97	15.03	.98	5.70	.04	.28
CHEST BREADTH	25.21	26.07	.86	3.29	26.25	1.04	3.97	-.18	-.71
WAIST BREADTH	21.46	22.44	.98	4.35	22.43	.97	4.32	.01	.03
HIP BREADTH	31.56	31.97	.41	1.28	32.49	.93	2.86	-.52	-1.63
SHOULDER BRDTH	38.30	39.01	.71	1.83	39.44	1.14	2.89	-.43	-1.09
SHOULDER CIRC	92.30	93.61	1.31	1.40	94.50	2.20	2.33	-.89	-.95
CHEST CIRC AT SCYE	77.14	78.62	1.48	1.88	79.33	2.19	2.76	-.71	-.90
BUST CIRC	80.02	82.16	2.14	2.61	83.22	3.20	3.84	-1.05	-1.28
CHEST CIRC	67.29	68.77	1.48	2.15	69.40	2.11	3.04	-.63	-.91
WAIST CIRC	60.13	62.26	2.13	3.41	62.33	2.20	3.53	-.07	-.12
HIP (BUTTOCK) CIRC	86.00	86.25	.25	.29	87.94	1.94	2.20	-1.69	-1.96
VERT TRUNK CIRC	142.98	142.70	-.28	-.20	144.23	1.25	.86	-1.53	-1.07
ARM SCYE CIRC	33.70	34.25	.55	1.60	34.59	.89	2.57	-.34	-.99
BICIPS CIRC,FLXD	23.26	24.20	.94	3.89	24.66	1.40	5.68	-.46	-1.89
FOREARM CIRC,FLXD	22.38	22.92	.54	2.36	23.25	.87	3.74	-.33	-1.44
WRIST CIRC	13.72	14.01	.29	2.08	14.12	.40	2.80	-.10	-.74
UPPER THIGH CIRC	48.93	50.04	1.11	2.23	51.18	2.25	4.40	-1.14	-2.27
CALF CIRC	30.74	31.55	.81	2.58	32.03	1.29	4.02	-.48	-1.51
ANKLE CIRC	18.90	19.34	.44	2.28	19.75	.85	4.29	-.41	-2.10
SHOULDER LTH	13.11	14.15	1.04	7.34	14.10	.99	7.02	.05	.35
BACK CURV AT BUST	37.33	39.06	1.73	4.42	39.43	2.10	5.33	-.37	-.95
WAIST BACK	36.84	38.39	1.55	4.03	38.49	1.65	4.27	-.10	-.25
NECK-BUSTPOINT LT	22.27	23.71	1.44	6.08	23.81	1.54	6.48	-.10	-.42
SLEEVE INSEAM	40.49	41.77	1.28	3.07	41.70	1.21	2.91	.07	.17
HEAD BREADTH	13.63	14.25	.62	4.37	14.30	.67	4.69	-.05	-.33
HEAD LENGTH	17.39	18.03	.64	3.54	18.06	.67	3.72	-.03	-.19
HAND BREADTH	7.00	7.28	.28	3.88	7.30	.30	4.17	-.02	-.30
HAND CIRC	16.93	17.47	.54	3.18	17.56	.63	3.57	-.08	-.49
HAND LENGTH	16.36	16.98	.62	3.65	17.12	.76	4.44	-.14	-.83
FOOT LENGTH	22.29	22.58	.29	1.29	22.70	.41	1.79	-.11	-.51
FOOT BREADTH	8.08	8.37	.29	3.49	8.45	.37	4.42	-.08	-.97
ANKLE HEIGHT	9.23	10.50	1.27	12.10	10.40	1.17	11.26	.10	.95

* TOTAL GROUP N = 3235, SMALL SHORT SUBGROUP N = 116

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TABLE 12

COMPARISON OF 95TH PERCENTILE VALUES WITH LARGE-LONG SUBGROUP VALUES AND LARGE SIZE REGRESSION VALUES
COMBINED US ARMY 1977 AND USAF 1968 SAMPLE *

WEIGHT IN KILOGRAMS ALL OTHER MEASURMENT VALUES IN CENTIMETERS

VARIABLE NAME	95TH PERCENTILE	LARGE LONG MEAN	DEVIATION BETWEEN SUBGROUP MEAN AND 95TH XILE		REGRESSION VALUE	DEVIATION BETWEEN REGRESSION VALUE AND 95TH XILE		DEVIATION BETWEEN SUBGROUP MEAN AND REGRESSION VALUE	
			D	%D		D	%D	D	%D
WEIGHT	72.44	74.43	1.99	2.67	72.44	0.00	0.00	1.99	2.67
STATURE	173.06	174.23	1.17	.67	173.06	0.00	0.00	1.17	.67
SHOULDER HEIGHT	142.35	143.36	1.01	.71	142.27	-.08	-.06	1.09	.76
BUSTPOINT HEIGHT	127.45	127.22	-.23	-.18	126.56	-.89	-.70	.66	.52
WAIST HEIGHT	109.05	109.03	-.02	-.02	108.13	-.92	-.85	.90	.83
CROTCH HEIGHT	82.61	82.43	-.18	-.22	81.32	-1.29	-1.59	1.11	1.35
BUTTOCK HEIGHT	98.45	98.50	.05	.05	89.38	-1.07	-1.20	1.12	1.23
SITTING HEIGHT	90.85	90.00	-.85	-.94	89.90	-.95	-1.06	.10	.11
EYE HEIGHT SIT	78.96	77.96	-1.00	-1.28	77.81	-1.15	-1.48	.15	.20
POPLITEAL HEIGHT	44.96	44.90	-.06	-.14	44.85	-.91	-2.97	.85	1.89
BUTTOCK-KNEE LTH	62.52	62.73	.21	.34	62.24	-.28	-.45	.49	.78
BUST DEPTH	27.03	25.69	-1.34	-5.20	25.44	-1.59	-6.26	.26	1.00
WAIST DEPTH	21.27	20.06	-1.21	-6.04	19.56	-1.71	-8.75	.50	2.50
CHEST BREADTH	31.41	30.46	-.95	-3.12	30.24	-1.17	-3.66	.22	.71
WAIST BREADTH	28.76	27.95	-.81	-2.89	27.39	-1.37	-5.01	.57	2.03
HIP BREADTH	39.15	38.24	-.91	-2.39	38.17	-.98	-2.57	.07	.18
SHOULDER BROTH	45.76	44.90	-.86	-1.91	44.84	-.92	-2.05	.06	.13
SHOULDER CIRC	109.32	107.74	-1.58	-1.47	107.24	-2.08	-1.94	.50	.46
CHEST CIRC AT SCYE	93.75	91.85	-1.90	-2.07	91.13	-2.62	-2.87	.72	.78
BUST CIRC	99.75	96.62	-3.13	-3.24	96.01	-3.74	-3.90	.61	.63
CHEST CIRC	83.25	80.80	-2.45	-3.03	80.50	-2.75	-3.41	.30	.37
WAIST CIRC	80.41	77.95	-2.46	-3.15	76.31	-4.10	-5.37	1.64	2.10
HIP (BUTTOCK) CIRC	105.92	104.33	-1.59	-1.52	104.25	-1.67	-1.61	.09	.08
VERT TRUNK CIRC	166.18	165.27	-.91	-.55	165.31	-.87	-.53	-.03	-.02
ARM SCYE CIRC	41.34	40.65	-.69	-1.69	40.36	-.98	-2.44	.30	.74
BICIPS CIRC,FLXD	30.74	29.59	-1.15	-3.98	29.40	-1.34	-4.56	.19	.63
FOREARM CIRC,FLXD	27.36	26.83	-.56	-2.07	26.67	-.69	-2.68	.14	.52
WRIST CIRC	16.07	15.75	-.32	-2.06	15.69	-.38	-2.42	.06	.35
UPPER THIGH CIRC	63.52	62.03	-1.49	-2.40	61.79	-1.73	-2.81	.24	.39
CALF CIRC	38.59	37.38	-1.21	-3.23	37.44	-1.15	-3.07	-.06	-.15
ANKLE CIRC	23.12	22.16	-.96	-4.34	22.30	-.82	-3.78	-.14	-.62
SHOULDER LTH	16.58	15.75	-.83	-5.25	15.56	-1.02	-6.57	.19	1.23
BACK CURV AT BUST	47.49	45.46	-2.03	-4.46	45.16	-2.33	-5.17	.31	.67
WAIST BACK	44.77	43.26	-1.51	-3.49	42.96	-1.81	-4.21	.38	.69
NECK-BUSTPOINT LT	28.79	27.65	-1.14	-4.11	27.24	-1.55	-5.68	.41	1.49
SLEEVE INSEAM	48.84	47.99	-.85	-1.77	47.48	-1.36	-2.87	.51	1.07
HEAD BREADTH	15.53	14.87	-.66	-4.41	14.85	-.68	-4.54	.02	.16
HEAD LENGTH	19.67	19.17	-.50	-2.58	19.05	-.62	-3.25	.12	.64
HAND BREADTH	8.35	8.16	-.19	-2.34	8.06	-.29	-3.56	.10	1.18
HAND CIRC	19.86	19.42	-.44	-2.26	19.28	-.58	-2.99	.14	.71
HAND LENGTH	19.82	19.00	-.82	-4.31	18.93	-.89	-4.69	.07	.36
FOOT LENGTH	26.17	26.03	-.14	-.52	25.77	-.40	-1.54	.26	1.00
FOOT BREADTH	9.74	9.35	-.39	-4.20	9.33	-.41	-4.43	.02	.22
ANKLE HEIGHT	13.29	11.87	-1.42	-11.94	11.73	-1.56	-13.27	.14	1.17

* TOTAL GROUP N = 3235, LARGE LONG SUBGROUP N = 114

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Section IV

COMPARISON OF METHODS

There have been two major problems associated with the use of percentile data to design items for persons at the extreme ends of the size ranges; (1) the percentile body segments are not additive, and (2) the proportions of percentile segments are not found in nature. If subgroup or regression data are to prove any more useful than the percentile method, they must demonstrate improved additive properties and more realistically proportioned segments. To show how the three methods compare, we illustrated their additive properties in Tables 13 and 14 using the combined female samples (n=3235). Though the female sample is used throughout this comparison, the male data showed the same results. Stature is divided into seven height segments. It goes without saying that the sum of these segments should equal total stature. The value for each segment was computed for each subject. Then the small and large, percentile, subgroup, and regression values were computed for these segments. The sum of the 5th percentile height segments is 136.89 cm, which is 15.6 cm less than the 5th percentile stature. The 95th percentile segment sum is 188.81 cm, which is 15.75 cm greater than the 95th percentile stature. By comparison, the subgroup and regression segment values add up to their respective statures, precisely. There is no simple way to segment weight, so bust circumference, a variable which is highly correlated with weight, was segmented. Using the combined female sample again, front curvature at bust was derived for all the subjects by subtracting back curvature at bust from bust circumference (see Table 14). The percentile values, the subgroup mean values, and the regression values were obtained. As can be seen in Tables 13 and 14, the sum of the two percentile curvature values did not add up to the percentile bust circumference whereas the subgroup and regression curvature values did add up to their respective bust circumferences.

The proportionality of the segments is illustrated in Table 15. Height segment values are represented as percentages of stature and the curvatures are represented as percentages of bust circumference.

The regression proportions are close enough to the subgroup proportions to suggest that the regression and subgroup proportions may only differ because of rounding error. This similarity exists in spite of the fact that the actual values for variables are not equal. The percentile proportions often differ as much as two percent from the other two, indicating that percentile proportions may inaccurately represent the proportions of small and large people.

Perhaps the most obvious point to be noted in Table 15 is that the percentile segments, once again, do not add up to a whole body. Model makers have dealt with this discrepancy in

TABLE 13

ADDITIVE HEIGHT SEGMENTS
COMBINED 1977 ARMY WOMEN AND 1968 AIR FORCE WOMEN*

1 - Shoulder to Vertex
2 - Bust to Shoulder
3 - Waist to Bust
4 - Buttock to Waist
5 - Crotch to Buttock
6 - Ankle to Crotch
7 - Ankle Height

SMALL SIZE

Variable Name	5th Percentile	Small-Short Mean	Regression
Shoulder to Vertex	27.05	26.84	29.07
Bust to Shoulder	10.79	13.11	12.90
Waist to Bust	13.42	16.40	16.74
Buttock to Waist	13.78	16.72	17.02
Crotch to Buttock	4.78	7.14	7.19
Ankle to Crotch	57.84	58.96	59.18
Ankle Height	9.23	10.50	10.40
TOTAL	136.89	151.67	152.50
STATURE	152.50	151.67	152.50

LARGE SIZE

Variable Name	95th Percentile	Large-Long Mean	Regression
Shoulder to Vertex	32.79	30.87	30.79
Bust to Shoulder	17.77	16.14	15.71
Waist to Bust	21.78	18.19	18.43
Buttock to Waist	21.67	18.53	18.75
Crotch to Buttock	10.42	8.07	8.06
Ankle to Crotch	71.09	70.55	69.58
Ankle Height	13.29	11.87	11.73
TOTAL	188.81	174.22	173.05
STATURE	173.06	174.23	173.06

* All values are in centimeters; total sample size=3235;
small-short subgroup n=114; large-long subgroup n=115.

TABLE 14

ADDITIVE CIRCUMFERENCE SEGMENTS
COMBINED 1977 ARMY WOMEN AND 1968 AIR FORCE WOMEN*

SMALL SIZE

Variable Name	5th Percentile	Small-Short Mean	Regression
Front Curvature at Bust	40.46	43.10	43.79
Back Curvature at Bust	37.33	39.06	39.43
TOTAL	77.79	82.16	83.22
BUST CIRCUMFERENCE	80.02	82.16	83.22
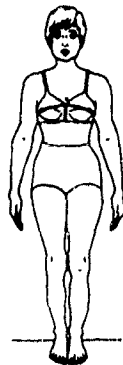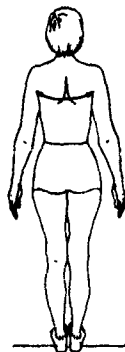
Front Curvature at Bust	Back Curvature at Bust	Bust Circumference

LARGE SIZE

Variable Name	95th Percentile	Large-Long Mean	Regression
Front Curvature at Bust	54.74	51.15	50.85
Back Curvature at Bust	47.89	45.46	45.16
TOTAL	102.23	96.61	96.01
BUST CIRCUMFERENCE	99.75	96.62	96.01

* All values are in centimeters; total sample size=3235; small-short subgroup n=114; large long subgroup n=115.

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TABLE 15

HEIGHT SEGMENT VALUES AS A PERCENTAGE OF STATURE: CURVATURE VALUES AS A PERCENTAGE OF BUST CIRCUMFERENCE
(Combined 1977 Army Women and 1968 Air Force Women*)

Variable Name	5th%ile	Small-Short Subgroup $\bar{X}$	Regres- sion	95th%ile	Large-Long Subgroup $\bar{X}$	Regres- sion
Shoulder-Vertex	17.74	19.02	19.06	18.95	17.72	17.79
Bust-Shoulder	7.08	8.74	8.50	10.27	9.26	9.08
Waist-Bust	8.80	10.81	10.98	12.59	10.44	10.64
Buttock-Waist	9.04	11.02	11.16	12.52	10.63	10.83
Crotch-Buttock	3.13	4.71	4.72	6.07	4.63	4.62
Ankle-Crotch	37.93	38.87	38.81	41.08	40.69	40.20
Ankle Height	6.05	6.92	6.87	7.63	6.81	6.78
TOTAL	89.77%	99.99%	100.10%	109.11%	100.18%	99.94%
Front Curv at Bust	50.56	52.45	52.61	54.88	52.94	52.96
Back Curv at Bust	46.65	47.54	47.38	47.60	47.05	47.03
TOTAL	97.21%	99.99%	99.99%	102.48%	99.99%	99.99%

* Sample size=3235

several ways. Some have used the individual segment values which are most important to specific tasks and adjusted the other dimensions to create a 5th or 95th percentile body. In this way, a model-maker may, for example, build accurate percentile values for sitting height, hip breadth and arm reach into a model to be used in the design of a cockpit and adjust other dimensions, such as length and stature, to achieve a "realistic" total body, though it will not have 5th or 95th percentile sizes for the adjusted dimensions.

Another approach has been to prorate all the segments upwards or downwards so that their sums are equal to 5th or 95th percentile stature. Conversely, one can treat the sum of the percentile values as the stature of the whole figure (ignoring actual values for 5th and 95th percentile statures). A consequence of juggling percentile data to make the whole equal the sum of its parts is loss of accuracy--in the latter case, percentile statures on the "adjusted" models no longer represent actual stature measurements, while in the former case percentile statur is retained by the actual percentile value is lost for all the other segments. In both cases, the segments will maintain the same relationships to each other, a proportionality which is illustrated in the following table.

TABLE 16

HEIGHT SEGMENT VALUES AS A PERCENTAGE OF THEIR SUM
(Combined 1977 Army Women and 1968 Air Force Women*)

Variable Name	5th%ile	Small-Short Subgroup X̄	95%ile	Large-Long Subgroup X̄
Shoulder-Vertex	19.76	19.02	17.37	17.72
Bust-Shoulder	7.89	8.64	9.41	9.26
Waist-Bust	9.80	10.81	11.54	10.44
Buttock-Waist	10.07	11.02	11.47	10.63
Crotch-Buttock	3.49	4.71	5.56	4.63
Ankle-Crotch	42.25	38.87	39.65	40.69
Ankle Height	6.74	6.92	6.99	6.81
TOTAL	100.00%	99.99%	99.99%	100.18%

* Sample size=3235. Small-short subgroup n=116; large-long n=114

A study of the table reveals that while the percentile values seem to have moved closer to the subgroup values, the proportions of the percentile bodies continue to be unreliable. It can be seen, for example, that 5th percentile leg dimensions (ankle-crotch) are proportionately larger than the same dimensions on 95th percentile individuals, which is to say that small people would have proportionately longer legs than large people. Not only does this sizing phenomenon seem to run counter to observable fact, but it is directly contradicted by the subgroup values.

Thus it appears that the adjustment of percentile values tends to create as many problems as it seeks to resolve.

Another way of comparing percentile, subgroup and regression methods is to study the values of the deviations in percent as they appear in Tables 1 - 12. The deviation in percent between the subgroup mean and regression values seem to be very small as compared to their respective percent deviations from the percentile values. To illustrate more clearly, we tabulated frequency distributions of these percent deviations for the 1977 Army women's sample, the 1968 WAF sample, and the combined female sample (Tables 17 - 22).

Most of the deviations between the subgroup and regression methods lie within a range of ±2%D. This means that most of the variables have subgroup mean and regression values which are 98% or more alike. The deviations between the percentile values and either the regression or the subgroup mean values are, for the most part, much greater. These relationships showed up consistently in all the military samples used.

While the regression and subgroup methods produced values which were consistently within a range of ±2%D, these values were

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TABLE 17

FREQUENCY DISTRIBUTIONS OF THE PERCENT DEVIATIONS (%D) BETWEEN THE SMALL-SHORT SUBGROUP VALUES (SUB), THE 5TH PERCENTILE VALUES (5TH), AND THE REGRESSION VALUES (REG)

WAF - 1968*

Range %D	SUB to REG %D (No. of Variables)	5TH to SUB %D (No. of Variables)	5TH to REG %D (No. of Variables)
4.0 and up		25	34
3.8 to 4.0			4
3.6 to 3.8		2	1
3.4 to 3.6		2	3
3.2 to 3.4		5	5
3.0 to 3.2		4	5
2.8 to 3.0		3	3
2.6 to 2.8			3
2.4 to 2.6		6	2
2.2 to 2.4	1	3	2
2.0 to 2.2	1	3	3
1.8 to 2.0	5	1	1
1.6 to 1.8	7	1	4
1.4 to 1.6	4	2	2
1.2 to 1.4	5	5	3
1.0 to 1.2	3	3	2
0.8 to 1.0	14	2	3
0.6 to 0.8	21	4	2
0.4 to 0.6	9	3	1
0.2 to 0.4	4	5	
0 to 0.2	11		6
-0.2 to 0		1	
-0.4 to -0.2	2	1	
-0.6 to -0.4	1	5	
-0.8 to -0.6		1	
-1.0 to -0.8			
-1.2 to -1.0			
-1.4 to -1.2	1		
-1.6 to -1.4	1	1	
-1.8 to -1.6			
-2.0 to -1.8			
	(97.7%)	(38.6%)	(27.3%)
-2.2 to -2.0			
-2.4 to -2.2			
-2.6 to -2.4			
-2.8 to -2.6			
-3.0 to -2.8			
Less than 3.0			

* Small-short subgroup n=59

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TABLE 18

FREQUENCY DISTRIBUTIONS OF THE PERCENT DEVIATIONS (%D) BETWEEN THE SMALL-SHORT SUBGROUP VALUES (SUB), THE 5TH PERCENTILE VALUES (5TH), AND THE REGRESSION VALUES (REG)

ARMY WOMEN - 1977*

Range %D	SUB to REG %D (No. of Variables)	5TH to SUB %D (No. of Variables)	5TH to REG %D (No. of Variables)
4.0 and up		15	20
3.8 to 4.0			2
3.6 to 3.8		2	5
3.4 to 3.6	1	2	3
3.2 to 3.4		2	
3.0 to 3.2	2	2	3
2.8 to 3.0		2	3
2.6 to 2.8		1	7
2.4 to 2.6		4	4
2.2 to 2.4	5	2	2
2.0 to 2.2		7	1
1.8 to 2.0	2	2	4
1.6 to 1.8	3	6	2
1.4 to 1.6	6	5	2
1.2 to 1.4	3	4	2
1.0 to 1.2	3	4	1
0.8 to 1.0	7		
0.6 to 0.8	11	1	3
0.4 to 0.6	5		
0.2 to 0.4	9	3	2
0 to 0.2	4	1	3
-0.2 to 0	4	1	
-0.4 to -0.2			
-0.6 to -0.4		3	
-0.8 to -0.6	1 (88.4%)	1 (44.9%)	(27.5%)
-1.0 to -0.8			
-1.2 to -1.0			
-1.4 to -1.2	1		
-1.6 to -1.4	1		
-1.8 to -1.6	1		
-2.0 to -1.8			
-2.2 to -2.0			
-2.4 to -2.2		1	
-2.6 to -2.4			
-2.8 to -2.6			
-3.0 to -2.8			
Less than 3.0			

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* Small-short subgroup n=55

TABLE 19

FREQUENCY DISTRIBUTIONS OF THE PERCENT DEVIATIONS (%D)
BETWEEN THE LARGE-LONG SUBGROUP VALUES (SUB), THE
95TH PERCENTILE VALUES (95TH), AND THE REGRESSION VALUES (REG)

WAF - 1968*

Range %D	SUB to REG %D (No. of Variables)	95TH to SUB %D (No. of Variables)	95TH to REG %D (No. of Variables)
4.0 and up		15	21
3.8 to 4.0			3
3.6 to 3.8		4	3
3.4 to 3.6		2	8
3.2 to 3.4		3	2
3.0 to 3.2		5	5
2.8 to 3.0		3	1
2.6 to 2.8	2	1	5
2.4 to 2.6		7	3
2.2 to 2.4	1	3	4
2.0 to 2.2	1	2	2
1.8 to 2.0	1	5	4
1.6 to 1.8	4	2	4
1.4 to 1.6	5	7	4
1.2 to 1.4	6	5	1
1.0 to 1.2	10	1	4
0.8 to 1.0	7	4	3
0.6 to 0.8	6	5	3
0.4 to 0.6	14	4	
0.2 to 0.4	8	2	2
0 to 0.2	15	2	6
-0.2 to 0	3		
-0.4 to -0.2	1	4	
-0.6 to -0.4	2	(46.6%)	(35.2%)
-0.8 to -0.6	(94.3%)		
-1.0 to -0.8	1		
-1.2 to -1.0			
-1.4 to -1.2			
-1.6 to -1.4			
-1.8 to -1.6			
-2.0 to -1.8			
-2.2 to -2.0	1		
-2.4 to -2.2			
-2.6 to -2.4			
-2.8 to -2.6		1	
-3.0 to -2.8		1	
Less than 3.0			

* Large-long subgroup n=66

TABLE 20

FREQUENCY DISTRIBUTIONS OF THE PERCENT DEVIATIONS (%D) BETWEEN THE LARGE-LONG SUBGROUP VALUES (SUB), THE 95TH PERCENTILE VALUES (95TH), AND THE REGRESSION VALUES (REG)

ARMY WOMEN - 1977*

Range %D	SUB to REG %D (No. of Variables)	95TH to SUB %D (No. of Variables)	95TH to REG %D (No. of Variables)
4.0 and up		16	17
3.8 to 4.0		3	
3.6 to 3.8		1	2
3.4 to 3.6		1	3
3.2 to 3.4		3	2
3.0 to 3.2			5
2.8 to 3.0		2	4
2.6 to 2.8		2	5
2.4 to 2.6		7	4
2.2 to 2.4		3	2
2.0 to 2.2		1	3
1.8 to 2.0		4	4
1.6 to 1.8	1	3	2
1.4 to 1.6	1	3	4
1.2 to 1.4	5	4	2
1.0 to 1.2	7	3	2
0.8 to 1.0	6	2	1
0.6 to 0.8	11		2
0.4 to 0.6	8	3	
0.2 to 0.4	9	1	2
0 to 0.2	8	3	3
-0.2 to 0	8	1	
-0.4 to -0.2	2	2	
-0.6 to -0.4			
-0.8 to -0.6	1		
-1.0 to -0.8	2		
-1.2 to -1.0			
-1.4 to -1.2		1	
-1.6 to -1.4			
-1.8 to -1.6			
-2.0 to -1.8			
	(100%)	(43.5%)	(31.9%)
-2.2 to -2.0			
-2.4 to -2.2			
-2.6 to -2.4			
-2.8 to -2.6			
-3.0 to -2.8			
Less than 3.0			

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* Large-long subgroup n=54

TABLE 21

FREQUENCY DISTRIBUTIONS OF THE PERCENT DEVIATIONS (%D) BETWEEN THE SMALL-SHORT SUBGROUP VALUES (SUB), THE 5TH PERCENTILE VALUES (5TH), AND THE REGRESSION VALUES (REG)

COMBINED FEMALE SAMPLE*

Range %D	SUB to REG %D (No. of Variables)	5TH to SUB %D (No. of Variables)	5th REG %D (No. of Variables)
4.0 and up		7	16
3.8 to 4.0		4	2
3.6 to 3.8		1	2
3.4 to 3.6		1	1
3.2 to 3.4		3	1
3.0 to 3.2		1	
2.8 to 3.0			4
2.6 to 2.8		1	
2.4 to 2.6	1	1	
2.2 to 2.4		3	2
2.0 to 2.2	2	2	
1.8 to 2.0	1	2	1
1.6 to 1.8	2		2
1.4 to 1.6	3	3	1
1.2 to 1.4		2	1
1.0 to 1.2	4	1	
0.8 to 1.0	5	1	2
0.6 to 0.8	4		1
0.4 to 0.6	6		1
0.2 to 0.4	5	1	
0 to 0.2	2	1	3
-0.2 to 0	3		
-0.4 to -0.2	1	2	
-0.6 to -0.4		1	
-0.8 to -0.6	(92.5%)	1 (40%)	(30%)
-1.0 to -0.8			
-1.2 to -1.0	1		
-1.4 to -1.2			
-1.6 to -1.4			
-1.8 to -1.6			
-2.0 to -1.8		1	
-2.2 to -2.0			
-2.4 to -2.2			
-2.6 to -2.4			
-2.8 to -2.6			
-3.0 to -2.8			
Less than 3.0			

* Small-short subgroup n=116

TABLE 22

FREQUENCY DISTRIBUTIONS OF THE PERCENT DEVIATIONS (%D) BETWEEN THE LARGE-LONG SUBGROUP VALUES (SUB), THE 95TH PERCENTILE VALUES (95TH), AND THE REGRESSION VALUES (REG)

COMBINED FEMALE SAMPLE*

Range %D	SUB to REG %D (No. of Variables)	95TH to SUB %D (No. of Variables)	95TH to REG %D (No. of Variables)
4.0 and up		9	13
3.8 to 4.0			1
3.6 to 3.8		1	1
3.4 to 3.6		1	2
3.2 to 3.4	1		1
3.0 to 3.2		2	2
2.8 to 3.0	1	1	3
2.6 to 2.8		3	2
2.4 to 2.6	2	1	1
2.2 to 2.4		3	
2.0 to 2.2		1	1
1.8 to 2.0	1	3	1
1.6 to 1.8	1		1
1.4 to 1.6			2
1.2 to 1.4	5	2	1
1.0 to 1.2	5		1
0.8 to 1.0	7	1	1
0.6 to 0.8	6		1
0.4 to 0.6	4	2	2
0.2 to 0.4	3	3	
0 to 0.2	3	2	3
-0.2 to 0			
-0.4 to -0.2			
-0.6 to -0.4	1		
-0.8 to -0.6	(90%)	(40%)	(32.5%)
-1.0 to -0.8			
-1.2 to -1.0			
-1.4 to -1.2			
-1.6 to -1.4			
-1.8 to -1.6			
-2.0 to -1.8			
-2.2 to -2.0			
-2.4 to -2.2			
-2.6 to -2.4			
-2.8 to -2.6			
-3.0 to -2.8			
Less than 3.0			

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* Large-long subgroup n=114

nevertheless not the same. One reason they do not produce equal values is that the regression equations utilized percentile values of stature and weight which were not equal to the subgroup stature and weight values. To ascertain whether we could further improve the correlation between results achieved by the two preferred methods, we inserted the subgroup stature and weight values as input into the regression equations for the combined female sample. A frequency distribution of the percent deviations between the subgroup and regression values was tabulated (Table 23) and shows that the differences between the values were indeed less but still not equal.

There are two further explanations for the differences which persist between the subgroup and regression values. First, the subgroups may be too small causing the possibility of erratic mean values. Second, the statistics involved in the regression equation may be inaccurately predicting values.

Many statistics, including the standard deviation which is used in the regression equation, assume a theoretical, symmetrical, bell-shaped distribution curve, which has been "fitted" to the data-- the so-called normal curve. In reality, most distributions do not have this exact shape. Most variables have somewhat skewed, i.e., nonsymmetrical, distributions. Some are more skewed than others. We found that the variables which had regression values least like the subgroup values were also those which were often skewed in comparison with most of the other variables. It appears that the more skewed the variable the less well the regression equation functions as a predictor.

To illustrate skewness, we approximated normal curves for weight and upper thigh circumference using means and standard deviations from the 1968 WAF sample. These approximations were then plotted on the same graph as frequency distributions of their actual values (Figures 4 and 5). Weight and upper thigh circumference have a relatively high correlation coefficient (.840 in this sample), yet it can be seen that their skewness is not the same with upper thigh circumference being more symmetrically distributed than weight.

While it is difficult to determine how greatly the regression results are affected by deviations from the normal curve, comparison with subgroup values shows that the two methods produce consistently similar results. Since both methods also produce additive segments and nearly identical proportions, it seems the distributions are not so deviant from the normal curve as to greatly affect the regression values and, in any case, not so deviant as to affect design problems.

Basically, when using normal curve statistics there is always some margin of error. The larger the deviation of the data from the normal curve, the larger the margin of error. This should be kept in mind when using regression values.

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TABLE 23

FREQUENCY DISTRIBUTIONS OF THE PERCENT DEVIATIONS (%D) BETWEEN SUBGROUP AND REGRESSION VALUES (REGRESSION VALUES PREDICTED FROM SUBGROUP STATURE AND WEIGHT RATHER THAN PERCENTILE STATURE AND WEIGHT)

Range %D	SMALL-SHORT (No. of Variables)	LARGE-LONG (No. of Variables)
4.0 and up		
3.8 to 4.0		
3.6 to 3.8		
3.4 to 3.6		
3.2 to 3.4		
3.0 to 3.2		
2.8 to 3.0		
2.6 to 2.8		
2.4 to 2.6		
2.2 to 2.4		
2.0 to 2.2		
1.8 to 2.0		
1.6 to 1.8	2	
1.4 to 1.6	1	1
1.2 to 1.4		1
1.0 to 1.2	4	1
0.8 to 1.0	1	3
0.6 to 0.8	2	1
0.4 to 0.6	6	7
0.2 to 0.4	4	5
0 to 0.2	7	5
-0.2 to 0	4	2
-0.4 to -0.2	2	5
-0.6 to -0.4	3	5
-0.8 to -0.6	3	1
-1.0 to -0.8		1
-1.2 to -1.0		1
-1.4 to -1.2		
-1.6 to -1.4	1 (100%)	(100%)
-1.8 to -1.6		
-2.0 to -1.8		
-2.2 to -2.0		
-2.4 to -2.2		
-2.6 to -2.4		
-2.8 to -2.6		
-3.0 to -2.8		
Less than 3.0		

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* Small-short subgroup n=116; large-long subgroup n=114

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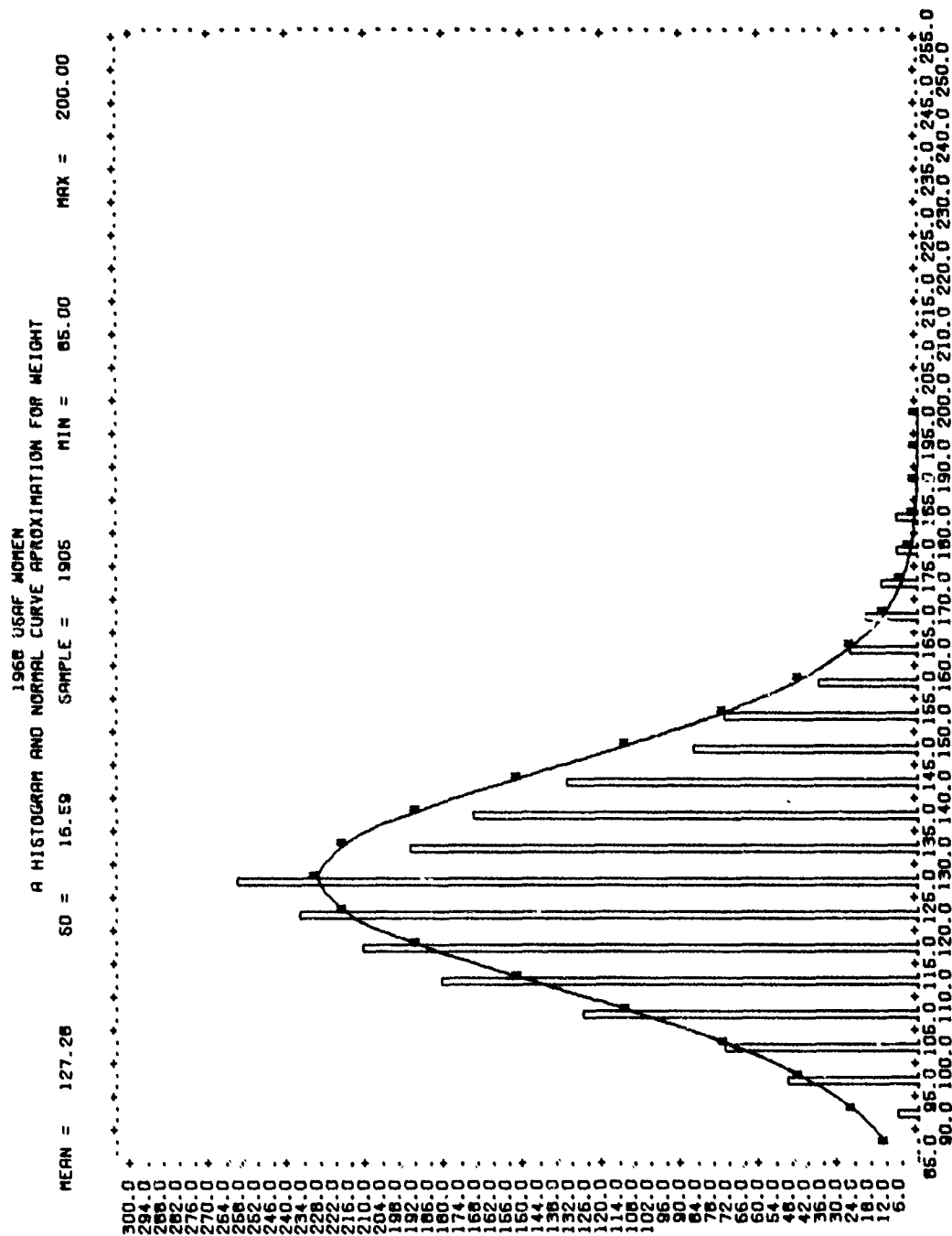
Figure 4. A histogram and normal curve approximation for weight for 1968 USAF women.
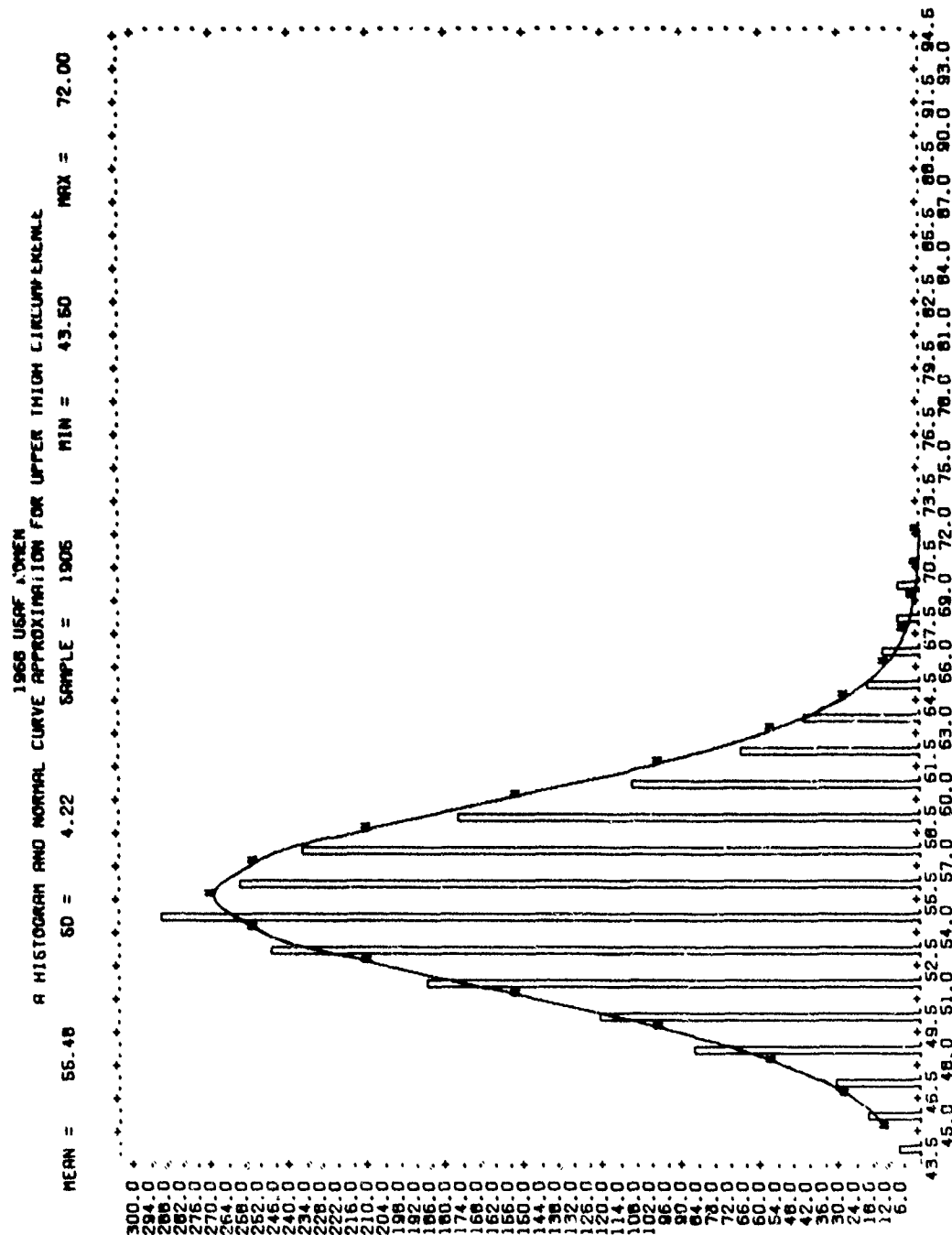
Figure 5. A histogram and normal curve approximation for upper thigh circumference for 1968 USAF women.

Section V

CONCLUSION

Three general conclusions reached by McConville and Churchill in their earlier study are supported by our analysis. First, the percentile method is unrealistic and unreliable for most design purposes. Second, the subgroup and regression methods are both improvements over the percentile method and, of these two, the regression method will normally produce the most accurate and useful data for designers.

We have demonstrated in this report that virtually no combination of 5th or 95th percentile values will add up to a valid whole person, nor will these values, when assembled, represent an accurately proportioned person. These basic defects hold true for as few as two percentile values since, as we demonstrated, 5th percentile front and back curvatures at bust level will not add up to 5th percentile bust circumference. Model makers have traditionally coped with this problem either by disregarding the sum total of the percentile parts, or by performing a series of cutting and stretching operations on the less "relevant" dimensions. While the collective percentile model should be viewed with great caution by designers, percentile values, nevertheless, have merit when used individually. If, for example, one is concerned only with the design of a seat which must be large enough to accommodate 95% of the population in terms of sitting height or hip breadth, then 95th percentile values of those dimensions are useful. They are known to encompass 95% of the population and they are readily available.

The subgroup method, which has been shown to be far more accurate in portraying persons at the tails of the distribution than the percentile method, is not the procedure of choice for many design problems since, often, the target populations may provide only very small numbers of people in the large and small categories. The resulting data will be unreliably erratic if the sample is too small or if it contains even one person with unusually deviant dimensions. Because the subgroup data represent the measurements of real people, its chief usefulness, for our purposes, was to provide a check for the validity of the other two methods.

The regression method is recommended because it results in the most reliable dimensional data for the whole body and its component parts, as shown in this report, but also because it is the most flexible method. In addition to predicting accurate values, any given values of stature and weight can be used in the regression equation so that values can be estimated for any other variable for any desired stature and weight. Like the dimensions resulting from use of the subgroup method, regression values are additive and, when assembled, produce a model in which all the parts are proportional.

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APPENDIX

Presented in Part A of the Appendix are the regression equations which were used in this study. As previously cited, they may be employed not just to predict 5th and 95th percentile values but to predict values in any size category. For workspace designers particularly concerned with dimensions of the seated operator, we have developed comparable regression equations using sitting height in place of stature (Part B). These equations appear to be nearly as reliable predictors as those based on weight and stature with better than 98% agreement between most subgroups and regression values.

A list of tables containing the regression equations in Parts A and B of this Appendix is given below:

	Table No.		Regressions Based On
PART A	24	1966 U.S. Army Men	- Ht & Wt
	25	1967 USAF Men	- Ht & Wt
	26	Combined Men	- Ht & Wt
	27	1968 AF Women	- Ht & Wt
	28	1977 U.S. Army Women	- Ht & Wt
	29	Combined Women	- Ht & Wt
PART B	30	1966 U.S. Army Men	- Sit Ht & Wt
	31	1967 USAF Men	- Sit Ht & Wt
	32	Combined Men	- Sit Ht & Wt
	33	1968 AF Women	- Sit Ht & Wt
	34	1977 U.S. Army Women	- Sit Ht & Wt
	35	Combined Women	- Sit Ht & Wt

TABLE 24

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING MEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE*
1966 ARMY MEN

VARIABLE	R				SE EST
WEIGHT	1.000	1.000*WT	+0.000*HT +	0.00	0.00
STATURE	1.000	C.000*WT	+1.000*HT +	0.00	0.00
CERVICALE HEIGHT	.944	.016*WT +	.877*HT -	6.04	2.09
SHOULDER HEIGHT	.953	.013*WT +	.874*HT -	10.88	1.88
WAIST HEIGHT	.841	-.005*WT +	.693*HT -	13.81	2.91
FUNCTIONAL REACH	.586	.024*WT +	.38** +	12.29	3.93
CROTCH HEIGHT	.840	-.042*WT +	.65 -	23.33	2.54
PATELLA HEIGHT-TOP	.740	-.004*WT +	.3 -	11.42	2.19
CALF HEIGHT	.598	-.003*WT +	.25 -	7.74	2.16
VERTICAL REACH/SIT	.836	.017*WT +	.702*HT +	13.01	3.18
SITTING HEIGHT	.724	.008*WT +	.386*HT +	22.05	2.53
EYE HEIGHT/SITTING	.654	.008*WT +	.339*HT +	18.29	2.70
MID-SHOULDER HT/S	.650	.017*WT +	.278*HT +	11.15	2.41
KNEE HEIGHT/SITING	.798	.018*WT +	.295*HT -	.28	1.64
POPLITEAL HEIGHT	.669	-.020*WT +	.281*HT -	1.25	1.86
CHEST DEPTH	.771	.072*WT -	.059*HT +	22.02	1.27
CHEST BREADTH/SKIN	.763	.074*WT -	.033*HT +	24.56	1.39
HIP BREADTH	.817	.068*WT +	.015*HT +	19.76	1.16
OCCIPUT-EX CANTHUS	.247	.009*WT +	.007*HT +	14.59	.95
OCCIPUT-TRAGION	.135	.006*WT +	.003*HT +	8.80	1.18
HEAD HEIGHT	.249	.006*WT +	.014*HT +	9.83	.77
SHOULDER-ELBOW LTH	.744	.067*WT +	.197*HT +	1.38	1.24
FOREARM-HAND LTH	.760	.011*WT +	.245*HT +	3.45	1.50
BUTTOCK-KNEE LTH	.833	.036*WT +	.279*HT +	5.05	1.58
BUTTOCK-POPLITEAL	.695	.017*WT +	.228*HT +	7.33	1.80
BIDELTOID DIAMETER	.806	.092*WT -	.033*HT +	36.49	1.50
MAX F"ARM-F"ARM BR	.805	.164*WT -	.180*HT +	51.30	2.50
HIP BREADTH/SITING	.855	.089*WT -	.013*HT +	22.27	1.24
BIZYGOMATIC DIAM	.538	.014*WT -	.007*HT +	12.99	.47
BITRAGION DIAMETER	.490	.013*WT -	.006*HT +	12.47	.49
HEAD LENGTH	.352	.008*WT +	.018*HT +	15.05	.69
OCCIPUT-NASAL ROOT	.336	.007*WT +	.018*HT +	14.85	.68
OCCIPUT-PRONASALE	.345	.007*WT +	.025*HT +	16.71	.78
HEAD BREADTH	.355	.009*WT -	.004*HT +	14.53	.55
INTERPUPILLARY DIS	.221	.003*WT +	.002*HT +	5.30	.39

*WEIGHT IN LBS   STATURE IN CM

TABLE 24 (cont'd)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING MEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE* 1966 ARMY MEN

VARIABLE	R				SE EST
MENTON-NASAL ROOT	.341	.005*WT +	.021*HT +	7.57	.62
HAND LENGTH	.625	.006*WT +	.080*HT +	4.11	.75
PALM LENGTH	.503	.004*WT +	.040*HT +	2.98	.54
THUMB CROTCH-FFB	.316	.003*WT +	.018*HT +	1.35	.49
HAND BREADTH	.489	.007*WT +	.018*HT +	4.65	.43
HEEL BREADTH	.533	.011*WT +	.001*HT +	4.94	.40
FOOT LENGTH	.701	.011*WT +	.114*HT +	5.13	.93
BALL OF FOOT LTH	.636	.010*WT +	.079*HT +	4.26	.81
BALL OF FOOT BR	.531	.009*WT +	.019*HT +	5.09	.46
HEAD CIRCUMFERENCE	.465	.030*WT +	.014*HT +	48.90	1.42
NECK CIRCUMFERENCE	.731	.070*WT -	.045*HT +	34.11	1.41
SHOULDER CIRCUMFER	.854	.251*WT -	.145*HT +	98.54	3.32
CHEST CIRCUMFER"CE	.871	.275*WT -	.225*HT +	89.28	3.28
WAIST CIRCUMFRNCE	.883	.343*WT -	.309*HT +	79.65	3.84
HIP CIRCUMFERENCE	.926	.263*WT -	.123*HT +	73.83	2.36
ARM SCYE CIRCUMFER	.708	.105*WT -	.045*HT +	35.70	2.30
BICEPS CIRC/EXTEND	.859	.114*WT -	.138*HT +	35.38	1.45
WRIST CIRCUMFRNCE	.642	.021*WT +	.020*HT +	10.23	.67
HAND CIRCUMFERENCE	.516	.020*WT +	.028*HT +	13.54	.97
BICEPS CIRC/FLEXED	.845	.112*WT -	.125*HT +	36.26	1.47
FOREARM CIR/FLEXED	.691	.068*WT -	.035*HT +	24.72	1.55
WAIST BACK LENGTH	.447	.022*WT +	.185*HT +	9.25	3.08
SHOULDER LENGTH	.219	.012*WT +	.033*HT +	8.53	1.93
INTERSCYE DISTANCE	.540	.078*WT -	.038*HT +	33.32	2.66
INTERSCYE MAXIMUM	.573	.089*WT +	.010*HT +	36.74	3.03
SLEEVE LENGTH	.744	.049*WT +	.335*HT +	19.58	2.64
SLEEVE INSEAM	.732	-.001*WT +	.300*HT -	3.61	1.83
VERTICAL TRUNK CIR	.781	.233*WT +	.297*HT +	75.21	5.30
UPPER THIGH CIRCUM	.887	.203*WT -	.190*HT +	56.29	2.21
LOWER THIGH CIRCUM	.698	.127*WT -	.100*HT +	37.61	2.77
CALF CIRCUMFERENCE	.805	.099*WT -	.058*HT +	30.98	1.58
ANKLE CIRCUMFRNCE	.683	.041*WT +	.005*HT +	15.30	1.05
HEEL-ANKLE CIRCUMF	.698	.033*WT +	.087*HT +	13.68	1.19
INSTEP CIRCUMF"NCE	.534	.031*WT +	.040*HT +	14.65	1.39
BALL OF FOOT CIRC	.529	.026*WT +	.043*HT +	13.38	1.26

*WEIGHT IN LBS STATURE IN CM

TABLE 25

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING MEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE*
1967 USAF MEN

VARIABLE	R				SE EST
AGE	.151	.051*WT -	.118*HT +	42.11	6.23
WEIGHT	1.000	1.000*WT +0.000*HT +		0.00	0.00
SKF SUBSCAP"R-LNGE	.656	.019*WT -	.032*HT +	3.74	.40
SKF TRICEPS-LANGE	.575	.016*WT -	.020*HT +	2.04	.42
SKF JUX"NIPPLE-LGE	.665	.024*WT -	.039*HT +	4.11	.50
SKF MAL XIPH"D-LGE	.702	.022*WT -	.036*HT +	3.77	.40
SKF SUPRAILIAC-LGE	.708	.045*WT -	.067*HT +	6.69	.83
SKF SUPRAPATELLA-L	.584	.007*WT -	.010*HT +	1.29	.19
SKF SUBSCAP"R-HARP	.672	.018*WT -	.032*HT +	3.94	.37
SKF TRICEPS-HARP"N	.609	.014*WT -	.020*HT +	2.35	.34
SKF SUPRAILIAC-HPN	.692	.039*WT -	.058*HT +	5.94	.75
GRIP STRENGTH	.399	.212*WT +	.499*HT -	.96	15.35
HEIGHT (STATURE)	1.000	0.000*WT +1.000*HT +		0.00	0.00
CERVICALE HEIGHT	.977	.010*WT +	.902*HT -	9.63	1.23
ACROMION HEIGHT	.961	.022*WT +	.853*HT -	9.88	1.60
RADIALE HEIGHT	.924	.025*WT +	.634*HT -	4.48	1.74
STYLION HEIGHT	.843	.020*WT +	.499*HT -	5.39	2.12
DACTYLION HEIGHT	.775	.018*WT +	.405*HT -	7.77	2.22
SUPRASTERNALE HGHT	.976	.019*WT +	.833*HT -	5.83	1.19
NIPPLE HEIGHT	.949	-.001*WT +	.806*HT -	13.51	1.65
WAIST HT-OMPHALION	.925	-.015*WT +	.733*HT -	20.91	1.79
ILIOCRISTALE HT	.914	.011*WT +	.690*HT -	15.12	1.95
BUTTOCK HEIGHT	.870	0.000*WT +	.617*HT -	19.31	2.17
TROCHANTERION HGHT	.887	-.009*WT +	.642*HT -	18.33	2.01
GLUTEAL FURROW HGT	.879	-.010*WT +	.589*HT -	21.60	1.91
CROTCH HEIGHT	.861	-.021*WT +	.613*HT -	19.99	2.11
PATELLA TOP HEIGHT	.855	.001*WT +	.352*HT -	9.98	1.33
KNEE CIRC HEIGHT	.859	.002*WT +	.342*HT -	11.35	1.27
FIBULAR HEIGHT	.845	0.000*WT +	.310*HT -	11.11	1.20
CALF HEIGHT	.747	.003*WT +	.264*HT -	11.79	1.48
ANKLE HEIGHT	.472	-.002*WT +	.092*HT -	2.25	1.01
SITTING HEIGHT	.789	.010*WT +	.385*HT +	23.17	1.95
EYE HEIGHT/SITTING	.739	.006*WT +	.349*HT +	18.01	2.03
MIDSHOULDER HT/SIT	.715	.026*WT +	.261*HT +	13.79	1.92
ACROMION H"GHT/SIT	.666	.028*WT +	.245*HT +	12.75	2.13

*WEIGHT IN LBS   STATURE IN CM

TABLE 25   (cont'd)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING MEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE* 1967 USAF MEN

VARIABLE	R				SE EST
ELBOW REST HGT/SIT	.272	.028*WT +	.029*HT +	15.16	2.51
KNEE HEIGHT/SITT"G	.887	.013*WT +	.332*HT -	5.37	1.15
POPLITEAL HGHT/SIT	.855	-.018*WT +	.339*HT -	13.29	1.16
BUTTOCK-KNEE LNGTH	.812	.042*WT +	.257*HT +	7.54	1.57
BUTTOCK-POPLITEAL	.729	.035*WT +	.224*HT +	4.58	1.76
ACRM-BICEP CIR LVL	.485	.004*WT +	.111*HT -	1.38	1.32
SHOULDER-ELBOW LTH	.753	.001*WT +	.207*HT -	.93	1.13
ACROMION-RADIALE L	.720	.002*WT +	.195*HT -	1.98	1.18
ELBOW-WRIST LENGTH	.738	.003*WT +	.163*HT +	.57	.95
RADIALE-STYLION LH	.703	.003*WT +	.155*HT -	1.13	1.01
ELBOW-GRIP LENGTH	.753	.002*WT +	.193*HT +	.63	1.06
THUMB-TIP REACH	.680	.017*WT +	.406*HT +	5.36	2.91
THUMB-TIP R"CH/XTD	.640	.015*WT +	.438*HT +	9.31	3.47
SLEEVE INSEAM	.719	-.013*WT +	.322*HT -	6.31	1.78
BIACROMIAL BREADTH	.482	.032*WT +	.062*HT +	24.18	1.70
BIDELTOID BREADTH	.806	.104*WT -	.060*HT +	40.82	1.52
CHEST BREADTH	.763	.083*WT -	.058*HT +	28.66	1.37
WAIST BRDTH-OMPH"N	.870	.107*WT -	.079*HT +	26.40	1.18
BICRISTALE BREADTH	.649	.063*WT -	.008*HT +	18.41	1.56
HIP BREADTH	.809	.071*WT +0.000*HT +		22.94	1.11
HIP BREADTH SITT"G	.859	.097*WT -	.034*HT +	26.98	1.18
ELBOW BRDTH BONE/R	.505	.005*WT +	.016*HT +	3.38	.31
ELBOW BRDTH BONE/L	.527	.005*WT +	.017*HT +	3.21	.30
F"ARM-F"ARM BR"DTH	.729	.144*WT -	.133*HT +	52.91	2.59
KNEE BR"DTH BONE/R	.644	.011*WT +	.014*HT +	5.58	.34
KNEE BR"DTH BONE/L	.652	.011*WT +	.015*HT +	5.39	.34
CHEST DEPTH	.792	.080*WT -	.081*HT +	25.00	1.17
WAIST DEPTH-OMPH"N	.805	.094*WT -	.115*HT +	26.38	1.29
BUTTOCK DEPTH	.851	.092*WT -	.093*HT +	24.49	1.08
THIGH CLEARANCE HT	.821	.060*WT -	.069*HT +	18.35	.79
NECK CIRC -MAXIMUM	.719	.071*WT -	.060*HT +	36.66	1.33
SHOULDER CIRCUM"CE	.841	.246*WT -	.141*HT +	100.00	3.14
CHEST CIRC AT SCYE	.830	.260*WT -	.204*HT +	93.30	3.38
CHEST CIRCUMF"ENCE	.861	.286*WT -	.263*HT +	95.55	3.23
WAIST CIR-OMPHAL"N	.893	.347*WT -	.352*HT +	89.79	3.32

*WEIGHT IN LBS   STATURE IN CM

TABLE   25   (cont'd)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING MEN'S
ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE*
1967 USAF MEN

VARIABLE	R				SE EST
WAIST CIR-OMPH/SIT	.866	.345*WT	- .389*HT +	96.50	3.74
BUTTOCK CIRCUMF"CE	.932	.257*WT	- .137*HT +	78.30	2.00
BUTTOCK CIRCUM/SIT	.899	.305*WT	- .178*HT +	86.26	2.94
VERTICAL TRUNK CIR	.857	.227*WT	+ .325*HT +	71.02	3.68
VERT TRUNK CIR/SIT	.814	.191*WT	+ .377*HT +	61.29	4.03
SCROTALE-ANT WAIST	.504	.034*WT	+ .072*HT +	9.77	1.78
SCROTALE-A WAIST/S	.469	.011*WT	+ .105*HT +	4.90	1.50
SCRTL-SUPRASTERNLE	.697	.085*WT	+ .141*HT +	29.09	2.45
SCRTL-SUPRSTRNLE/S	.641	.042*WT	+ .209*HT +	19.21	2.30
SCRTL-ANT SCYE LVL	.623	.059*WT	+ .159*HT +	15.37	2.45
SCRTL-ANT SCYE L/S	.537	.016*WT	+ .225*HT +	5.79	2.49
SCRTL-A MIDSHOULDR	.752	.104*WT	+ .146*HT +	33.42	2.45
SCRTL-A MDSHLDR/S	.687	.059*WT	+ .214*HT +	24.16	2.38
SCROTALE-PST WAIST	.617	.088*WT	- .023*HT +	24.16	2.30
SCRTL-WAIST OVR BK	.592	.080*WT	+ .022*HT +	24.83	2.44
SCROTALE-P WAIST/S	.491	.072*WT	+0.000*HT +	24.05	2.71
SCRTL-WAIST/BUTT/S	.514	.068*WT	+ .010*HT +	25.94	2.50
SCROTALE-CERVICALE	.732	.104*WT	+ .166*HT +	35.15	2.70
SCROTALE-CERVCLE/S	.711	.102*WT	+ .160*HT +	38.37	2.79
SCRTL-PST SCYE LVL	.640	.085*WT	+ .116*HT +	26.85	2.74
SCRTL-PST SCYE L/S	.618	.084*WT	+ .106*HT +	31.18	2.83
SCRTL-P MIDSHOULDR	.766	.123*WT	+ .130*HT +	40.94	2.62
SCRTL-MDSHLD OVR B	.740	.110*WT	+ .179*HT +	40.61	2.80
SCRTL-P MDSHLDR/S	.738	.123*WT	+ .125*HT +	43.78	2.83
SCRTL-MDSHLD O B/S	.740	.114*WT	+ .154*HT +	42.16	2.76
UPPER THIGH CIRCUM	.897	.210*HT	- .212*HT +	59.96	1.96
UPPER THIGH C/SIT	.914	.204*HT	- .192*HT +	56.52	1.73
KNEE CIRCUMFERENCE	.848	.083*WT	- .006*HT +	25.33	1.10
KNEE CIRCUM"CE/SIT	.855	.085*WT	+0.000*HT +	24.54	1.10
CALF CIRCUMF/RIGHT	.801	.095*WT	- .080*HT +	34.89	1.36
CALF CIRCUMF/LEFT	.804	.092*WT	- .071*HT +	33.55	1.33
ANKLE CIRCUMF"ENCE	.695	.042*WT	- .009*HT +	16.72	.91
SCYE CIRCUMFERENCE	.742	.098*WT	- .014*HT +	33.83	1.86
BICEPS C-EXTEND/RT	.856	.107*WT	- .136*HT +	36.33	1.21
BICEPS C-EXTEND/LT	.867	.109*WT	- .139*HT +	36.12	1.17

*WEIGHT IN LBS STATURE IN CM

TABLE 25 (cont'd)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING MEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE*
1967 USAF MEN

VARIABLE	R			SE EST
BICEPS C-FLEXED/RT	.819	.098*WT - .111*HT +	35.42	1.30
BICEPS C-FLEXED/LT	.830	.099*WT - .110*HT +	34.44	1.25
ELBOW CIR-EXTENDED	.786	.056*WT - .020*HT +	21.49	.89
ELBOW CIRC-FLEXED	.602	.045*WT + .026*HT +	18.82	1.39
LOWER ARM C-EXTEND	.802	.060*WT - .038*HT +	24.48	.87
LOWER ARM C-FLEXED	.717	.056*WT - .022*HT +	23.95	1.10
WRIST CIRCUMF"ENCE	.589	.024*WT + .009*HT +	11.82	.75
SLVE L/SPINE-SCYE	.527	.044*WT + .007*HT +	19.57	1.54
SLVE L/SPINE-ELBOW	.701	.038*WT + .206*HT +	17.45	1.87
SLVE L/SPINE-WRIST	.789	.042*WT + .356*HT +	20.39	2.16
ANTERIOR NECK LGTH	.483	-.034*WT + .142*HT -	10.85	1.47
POSTERIOR NECK LTH	.293	-.017*WT + .091*HT +	.05	1.61
SHOULDER LENGTH	.359	.009*WT + .054*HT +	5.46	1.18
DELTOID ARC	.434	.007*WT + .078*HT +	.86	1.20
INTERSCYE	.414	.081*WT - .071*HT +	37.28	3.43
INTERSCYE MAXIMUM	.685	.087*WT + .059*HT +	35.97	2.20
WAIST FRONT-OMPH"N	.584	.050*WT + .058*HT +	21.45	1.80
CROTCH LGTH-OMPH"N	.725	.146*WT + .025*HT +	40.83	3.05
WAIST BACK-OMPHL"N	.604	.016*WT + .198*HT +	9.02	1.89
FOOT LENGTH	.693	.009*WT + .114*HT +	5.25	.86
INSTEP LENGTH	.622	.008*WT + .078*HT +	4.57	.75
FOOT BREADTH	.507	.007*WT + .021*HT +	4.83	.43
BALL-OF-FOOT CIRC	.584	.025*WT + .044*HT +	12.70	1.00
INSTEP CIRCUMF"NCE	.642	.029*WT + .039*HT +	13.74	.93
HEEL CIRCUMFERENCE	.746	.030*WT + .091*HT +	12.60	.94
BI-MALLEOLAR BRDTH	.547	.006*WT + .018*HT +	3.09	.32
LAT"L MALLEOLUS HT	.463	.004*WT + .033*HT +	.49	.48
MED"L MALLEOLUS HT	.444	.004*WT + .032*HT +	2.20	.51
HAND LENGTH	.654	.003*WT + .081*HT +	4.22	.62
PALM LENGTH	.538	.002*WT + .043*HT +	2.86	.46
HAND BR/METACARPLE	.494	.006*WT + .016*HT +	5.02	.36
HAND BRTH AT THUMB	.517	.007*WT + .022*HT +	5.08	.42
HAND C/METACARPALE	.539	.018*WT + .031*HT +	12.93	.79
HAND C ROUND THUMB	.610	.026*WT + .029*HT +	16.10	.86
HAND THICK/META-3	.271	.002*WT + .003*HT +	1.89	.20

*WEIGHT IN LBS   STATURE IN CM

TABLE 25 (cont'd)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING MEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE*
1967 USAF MEN

VARIABLE	R				SE EST
HEAD CIRCUMFERENCE	.423	.024*WT +	.026*HT +	48.74	1.29
SAGITTAL ARC/INION	.167	.005*WT +	.034*HT +	27.75	1.63
MINIMUM FRONTL ARC	.202	.008*WT -	.004*HT +	12.92	.77
BITRAGION-CORONAL	.327	.013*WT +	.031*HT +	28.00	1.19
BITRAGN-MIN FRNTAL	.375	.014*WT +	.017*HT +	25.36	.92
BITRAG"N-SUBNASALE	.466	.022*WT +	0.000*HT +	25.49	.90
BITRAGION-MENTON	.544	.030*WT +	.008*HT +	26.02	1.04
BIT-SUBMANDIBULAR	.533	.039*WT +	0.000*HT +	24.21	1.33
BITRAG"N-POSTERIOR	.301	.020*WT +	.004*HT +	25.26	1.43
HEAD LENGTH	.293	.006*WT +	.017*HT +	15.81	.64
HEAD DIAGNL/MENTON	.445	.009*WT +	.032*HT +	18.36	.68
HD DIAG/INION-NOSE	.263	.009*WT +	.017*HT +	17.36	.98
EAR BREADTH	.194	.002*WT +	.004*HT +	2.74	.30
EAR LENGTH	.302	.005*WT +	.007*HT +	4.49	.41
EAR L ABVE TRAGION	.127	.001*WT +	.005*HT +	1.88	.29
HEAD BREADTH	.306	.008*WT -	.002*HT +	14.57	.52
MAXIMUM FRONTAL BR	.303	.006*WT +	.004*HT +	9.85	.43
BITRAGION BREADTH	.398	.011*WT -	.001*HT +	12.52	.51
BIZYGOMATIC BR"DTH	.456	.012*WT -	.004*HT +	12.85	.46
BIGONIAL BREADTH	.434	.016*WT -	.016*HT +	11.79	.62
EAR-TO-EAR BREADTH	.281	.008*WT +	.013*HT +	15.14	.78
BIOCULAR BREADTH	.191	.004*WT +	.003*HT +	7.94	.48
INTERPUPILLARY BRD	.191	.003*WT +	.004*HT +	5.04	.36
INTEROCULAR BR"DTH	.158	.002*WT +	.001*HT +	2.81	.27
NOSE BREADTH	.199	.003*WT -	.002*HT +	3.38	.29
LIP LENGTH	.173	.003*WT +	0.000*HT +	4.71	.37
EAR PROTRUSION	.121	.001*WT +	.002*HT +	1.64	.33
SUBNASALE-NASAL RT	.197	0.000*WT +	.011*HT +	3.18	.36
PHILTRUM LENGTH	.137	.002*WT -	.001*HT +	1.38	.27
LIP-TO-LIP LENGTH	.124	-.001*WT +	.008*HT +	.49	.38
MENTON-SUBNASALE L	.194	.003*WT +	.010*HT +	4.61	.52
MENTON-NASAL ROOT	.293	.003*WT +	.021*HT +	7.79	.58
GLABELLA-TO-VERTEX	.108	-.001*WT +	.020*HT +	5.90	.97
NASAL ROOT-TO-VRTX	.173	0.000*WT +	.028*HT +	5.78	.93
XTRNL CANTHUS-VRTX	.181	0.000*WT +	.022*HT +	8.05	.76

*WEIGHT IN LBS STATURE IN CM

TABLE 25 (concluded)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING MEN'S
ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE*
1967 USAF MEN

VARIABLE	R				SE EST
PRONASALE-TO-VRTX	.192	-.002*WT +	.038*HT +	8.35	1.08
SUBNASALE-TO-VRTX	.229	-.001*WT +	.041*HT +	8.99	1.00
STOMION-TO-VERTEX	.241	0.000*WT +	.041*HT +	11.09	.97
MENTON-TO-VERTEX	.284	.001*WT +	.044*HT +	14.79	.98
TRAGION-TO-VERTEX	.210	.003*WT +	.015*HT +	10.26	.60
GLABELLA-TO-WALL	.312	.006*WT +	.019*HT +	15.94	.64
NASAL ROOT-TO-WALL	.311	.006*WT +	.019*HT +	15.76	.62
XTRNL CANTHUS-WALL	.232	.005*WT +	.009*HT +	15.32	.64
PRONASALE-TO-WALL	.318	.008*WT +	.016*HT +	18.45	.71
SUBNASALE-TO-WALL	.290	.009*WT +	.011*HT +	17.48	.75
LIP PROMIN"CE-WALL	.294	.011*WT +	.007*HT +	18.01	.82
CHIN PROMINCE-WALL	.329	.016*WT +	.002*HT +	17.34	.99
TRAGION-TO-WALL	.135	.004*WT +	.002*HT +	9.29	.64
GUESSED HEIGHT	.957	.012*WT +	.911*HT +	15.62	1.75
GUESSED WEIGHT	.977	.854*WT +	.273*HT -	23.10	4.24

*WEIGHT IN LBS STATURE IN CM

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TABLE 26

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING MEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE* COMBINED MEN

VARIABLE	R			SE EST
WEIGHT	1.000	1.000*WT +0.000*HT +	0.00	0.00
HEIGHT (STATURE)	1.000	0.000*WT +1.000*HT +	0.00	0.00
ACROMION HEIGHT	.952	.010*WT + .864*HT -	8.95	1.88
CERVICALE HEIGHT	.953	.013*WT + .882*HT -	6.48	1.90
SITTING HEIGHT	.751	.014*WT + .392*HT +	20.37	2.45
MIDSHOULDER HT/SIT	.685	.024*WT + .279*HT +	10.15	2.35
ANKLE CIRCUMF"ENCE	.633	.038*WT - .002*HT +	16.78	1.08
SCYE CIRCUMFERENCE	.732	.114*WT - .028*HT +	31.90	2.43
BICEPS C-FLEXED/RT	.831	.105*WT - .125*HT +	37.19	1.47
BIDELTOID BREADTH	.813	.102*WT - .032*HT +	35.12	1.66
BUTTOCK CIRCUMF"CE	.932	.266*WT - .122*HT +	73.42	2.31
BUTTOCK-KNEE LNGTH	.830	.036*WT + .273*HT +	6.00	1.59
CALF CIRCUMF/RIGHT	.799	.095*WT - .066*HT +	32.85	1.55
CALF HEIGHT	.624	-.003*WT + .251*HT -	8.05	2.02
CHEST BREADTH	.777	.082*WT - .034*HT +	23.76	1.48
CHEST CIRCUMF"ENCE	.877	.283*WT - .227*HT +	88.71	3.32
CROTCH HEIGHT	.846	-.038*WT + .644*HT -	22.44	2.44
BIZYGOMATIC BR"DTH	.540	.014*WT - .006*HT +	12.83	.47
FOOT LENGTH	.698	.010*WT + .113*HT +	5.41	.91
LOWER ARM C-FLEXED	.687	.063*WT - .034*HT +	25.21	1.47
HAND BR/METACARPLE	.473	.006*WT + .017*HT +	4.94	.42
HAND C/METACARPALE	.495	.018*WT + .027*HT +	13.93	.95
HAND LENGTH	.623	.004*WT + .079*HT +	4.55	.73
HEAD BREADTH	.387	.010*WT - .003*HT +	14.25	.55
HEAD CIRCUMFERENCE	.507	.033*WT + .021*HT +	47.43	1.45
HEAD LENGTH	.380	.008*WT + .019*HT +	14.94	.68
HIP BREADTH	.826	.073*WT + .016*HT +	19.05	1.23
INSTEP CIRCUMF"NCE	.450	.024*WT + .033*HT +	16.63	1.42
INSTEP LENGTH	.629	.008*WT + .078*HT +	4.71	.80
INTERPUPILLARY BRD	.247	.004*WT + .003*HT +	4.99	.38
INTERSCYE	.471	.073*WT - .053*HT +	36.40	2.94
MENTON-NASAL ROOT	.319	.004*WT + .021*HT +	7.70	.61
PALM LENGTH	.529	.004*WT + .041*HT +	2.82	.52
PATELLA TOP HEIGHT	.743	-.008*WT + .362*HT -	9.35	2.06
POPLITEAL HGHT/SIT	.677	-.026*WT + .238*HT -	1.87	1.81

*WEIGHT IN LBS   STATURE IN CM

TABLE 26 (cont'd)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING MEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE* COMBINED MEN

VARIABLE	R				SE EST
SHOULDER CIRCUM"CE	.862	.256*WT -	.138*HT +	96.84	3.32
SHOULDER-ELBOW LTH	.672	0.000*WT +	.192*HT +	2.97	1.38
SHOULDER LENGTH	.256	.012*WT +	.039*HT +	7.52	1.77
SLEEVE INSEAM	.715	-.007*WT +	.301*HT -	3.04	1.85
UPPER THIGH CIRCUM	.896	.208*WT -	.190*HT +	55.74	2.19
WAIST CIR-OMPHAL"N	.888	.358*WT -	.305*HT +	77.36	3.95
ILIOCRISTALE HT	.863	.002*WT +	.697*HT -	15.41	2.71

*WEIGHT IN LBS   STATURE IN CM

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TABLE 27

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE*
1968 USAF WOMEN

VARIABLE	R					SE EST
AGE	.238	.107*WT	− .105*HT +	26.83		6.27
WEIGHT	1.000	1.000*WT	+0.000*HT +	0.00		0.00
TRICEPS SKINFOLD	.662	.026*WT	− .030*HT +	3.46		.41
SUBSCAPULAR SKINFO	.663	.023*WT	− .032*HT +	3.55		.36
SUPRAILIAC SKINFLD	.634	.031*WT	− .034*HT +	3.54		.54
MEDIAL CALF SKINFD	.417	.015*WT	− .020*HT +	2.93		.47
STATURE	1.000	0.000*WT	+1.000*HT +	0.00		0.00
STATURE, MAXIMUM	.998	.001*WT	+1.000*HT +	.52		.38
CERVICALE HEIGHT	.977	.009*WT	+ .884*HT −	5.25		1.17
ACROMIAL HEIGHT	.960	.019*WT	+ .847*HT −	7.86		1.53
SUPRASTERNALE HGHT	.974	.015*WT	+ .836*HT −	5.43		1.21
BUST POINT HEIGHT	.928	−.015*WT	+ .828*HT −	13.99		1.95
WAIST HEIGHT	.914	.004*WT	+ .679*HT −	10.30		1.83
ABDOMINAL EXT HGT	.899	−.016*WT	+ .686*HT −	16.01		1.94
TROCHANTERIC HGHT	.852	.092*WT	+ .602*HT −	15.17		2.24
BUTTOCK HEIGHT	.848	.006*WT	+ .579*HT −	12.41		2.21
GLUTEAL FURROW HGT	.830	−.024*WT	+ .581*HT −	18.43		2.21
TIBIALE HEIGHT	.787	−.001*WT	+ .315*HT −	8.95		1.47
CROTCH HEIGHT	.849	−.006*WT	+ .581*HT −	18.91		2.13
ANKLE HEIGHT	.306	0.000*WT	+ .070*HT −	.16		1.29
LAT"L MALLEOLUS HT	.426	.001*WT	+ .040*HT +	.16		.53
SITTING HT,RELAXED	.783	.010*WT	+ .410*HT +	16.54		2.02
SITTING HEIGHT	.803	.015*WT	+ .401*HT +	19.69		1.89
EYE HEIGHT,SITTING	.740	.014*WT	+ .355*HT +	14.38		2.06
MIDSHOULDER HT,SIT	.729	.026*WT	+ .279*HT +	9.46		1.82
WAIST HGHT,SITTING	.452	.025*WT	+ .080*HT +	7.22		1.55
ELBOW REST HEIGHT	.213	.011*WT	+ .068*HT +	10.28		2.41
POPLITEAL HEIGHT	.728	−.002*WT	+ .230*HT +	4.02		1.28
BUTTOCK-POPLIT"L L	.702	.050*WT	+ .226*HT +	4.71		1.97
BUTTOCK-KNEE LNGTH	.839	.063*WT	+ .244*HT +	9.86		1.43
ACROMION-RADIALE L	.728	.008*WT	+ .185*HT −	.00		1.12
RADIALE-STYLION L	.666	.002*WT	+ .148*HT −	.86		1.02
THUMB-TIP REACH	.655	.029*WT	+ .375*HT +	9.65		2.93
THUMB-TIP,EXTENDED	.622	.040*WT	+ .439*HT +	7.58		3.82
OVERHEAD REACH	.853	.022*WT	+1.181*HT +	4.98		4.47

*WEIGHT IN LBS   STATURE IN CM

TABLE 27 (cont'd)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE*
1968 USAF WOMEN

VARIABLE	R			St EST
NECK CIRCUMFERENCE	.582	.058*WT + .003*HT +	25.88	1.36
SHOULDER CIRCUMFER	.845	.284*WT - .132*HT +	85.66	2.75
CHEST CIRC AT SCYE	.819	.271*WT - .156*HT +	75.04	2.85
BUST CIRCUMFERENCE	.824	.318*WT - .223*HT +	85.40	3.23
CHEST C BELOW BUST	.806	.261*WT - .149*HT +	65.26	2.88
WAIST CIRCUMFERNCE	.846	.312*WT - .203*HT +	60.40	2.92
ABDOMINAL EXT CIRC	.821	.406*WT - .300*HT +	82.60	4.15
HIP C-7""BLW WAIST	.903	.330*WT - .155*HT +	76.76	2.40
HIP C-9""BLW WAIST	.895	.351*WT - .155*HT +	75.72	2.68
UPPER THIGH CIRCUM	.867	.248*WT - .177*HT +	52.60	2.10
KNEE CIRCUMFERENCE	.822	.117*WT - .025*HT +	25.46	1.29
CALF CIRCUM, RIGHT	.763	.112*WT - .054*HT +	28.64	1.45
CALF CIRCUM, LEFT	.756	.113*WT - .051*HT +	28.12	1.49
ANKLE CIRCUMFERNCE	.593	.044*WT + .012*HT +	13.54	1.04
VERTICAL TRUNK CIR	.822	.265*WT + .318*HT +	69.15	3.91
VERTICAL TRK C,SIT	.811	.207*WT + .436*HT +	53.04	3.84
BUTTOCK CIRC, SIT	.912	.359*WT - .142*HT +	77.32	2.50
SCYE CIRCUMFERENCE	.778	.112*WT - .025*HT +	26.90	1.44
AXILLARY ARM CIRC	.850	.139*WT - .139*HT +	32.28	1.23
BICEPS C,RELAXED,R	.871	.140*WT - .152*HT +	32.43	1.13
BICEPS C,FLEXED, R	.865	.140*WT - .142*HT +	31.99	1.16
BICEPS C,RELAXED,L	.878	.149*WT - .163*HT +	33.12	1.15
BICEPS C,FLEXED, L	.867	.145*WT - .150*HT +	32.40	1.19
ELBOW CIRC, FLEXED	.586	.053*WT + .044*HT +	13.10	1.44
FOREARM C, RELAXED	.820	.075*WT - .038*HT +	20.09	.79
FOREARM C, FLEXED	.790	.079*WT - .037*HT +	20.92	.93
WRIST CIRCUMFERNCE	.658	.024*WT + .018*HT +	8.99	.54
BIACROMIAL BREADTH	.545	.035*WT + .073*HT +	19.55	1.37
BIDELTOID BREADTH	.811	.124*WT - .065*HT +	36.63	1.35
CHEST BREADTH	.710	.089*WT - .041*HT +	23.31	1.35
BUST PT-BUST PT BR	.598	.062*WT - .035*HT +	16.31	1.24
WAIST BREADTH	.773	.097*WT - .035*HT +	17.46	1.23
HIP BREADTH	.774	.109*WT - .031*HT +	26.12	1.40
THIGH-THIGH BR,SIT	.811	.158*WT - .117*HT +	37.05	1.67
HUMERAL BREADTH, R	.588	.007*WT + .014*HT +	2.97	.25

*WEIGHT IN LBS STATURE IN CM

TABLE 27 (cont'd)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE* 1968 USAF WOMEN

VARIABLE	R				SE EST
HUMERAL BREADTH, L	.594	.067*WT +	.014*HT +	2.94	.24
FEMORAL BREADTH, R	.496	.012*WT +	.008*HT +	5.29	.39
FEMORAL BREADTH, L	.522	.012*WT +	.007*HT +	5.48	.37
CHEST DEPTH	.770	.101*WT -	.075*HT +	22.95	1.23
WAIST DEPTH	.773	.089*WT -	.077*HT +	28.17	1.06
ABDOMINAL EXT DPTH	.830	.121*WT -	.104*HT +	22.35	1.18
BUTTOCK DEPTH	.836	.102*WT -	.078*HT +	20.81	.98
THIGH CLEARANCE	.716	.051*WT +	.015*HT +	3.51	.87
SHOULDER LENGTH	.377	.007*WT +	.052*HT +	5.34	.95
NECK-BUST POINT L	.574	.069*WT -	.017*HT +	19.47	1.55
STRAP LENGTH	.655	.159*WT -	.022*HT +	48.55	2.96
INTERSCYE	.546	.089*WT -	.054*HT +	32.48	2.04
INTERSCYE, MAXIMUM	.557	.101*WT +	.044*HT +	29.40	2.73
BACK CURVATURE	.615	.124*WT -	.061*HT +	36.25	2.41
WAIST BACK	.586	-.002*WT +	.220*HT +	5.10	1.80
ANTERIOR WAIST LTH	.523	.035*WT +	.097*HT +	13.40	1.67
SLEEVE INSEAM	.715	-.017*WT +	.311*HT -	4.12	1.69
SPINE-TO-SCYE LGTH	.431	.033*WT +	.010*HT +	14.54	1.22
SPINE-TO-ELBOW LTH	.722	.042*WT +	.211*HT +	13.77	1.66
SPINE-TO-WRIST LTH	.782	.045*WT +	.352*HT +	16.80	2.07
HAND LENGTH	.606	.005*WT +	.089*HT +	3.32	.76
HAND BREADTH	.457	.007*WT +	.014*HT +	4.39	.35
HAND CIRCUMFERENCE	.509	.023*WT +	.021*HT +	11.99	.78
FOOT LENGTH	.712	.013*WT +	.110*HT +	4.58	.79
FOOT BREADTH	.429	.009*WT +	.017*HT +	4.97	.45
HEAD LENGTH	.356	.008*WT +	.025*HT +	13.34	.63
HEAD BREADTH	.290	.011*WT -	.002*HT +	13.44	.57
HEAD CIRCUMFERENCE	.426	.031*WT +	.044*HT +	43.79	1.47
TRAGION-TOP HEAD	.267	.006*WT +	.022*HT +	8.40	.74
ECTOCANTHUS-TOP HD	.241	.003*WT +	.031*HT +	6.36	.89
PRONASALE-TOP HEAD	.241	.002*WT +	.044*HT +	7.37	1.14
SUBNASALE-TOP HEAD	.289	.003*WT +	.048*HT +	7.75	1.05
STOMION-TOP HEAD	.296	.003*WT +	.051*HT +	9.18	1.07
MENTON-TOP HEAD	.372	.008*WT +	.057*HT +	11.65	1.06
TRAGION TO WALL	.220	.008*WT +	.014*HT +	6.88	.88

*WEIGHT IN LBS STATURE IN CM

TABLE 27 (concluded)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S
ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE*
1968 USAF WOMEN

VARIABLE	R				SE EST
ECTOCANTHUS-WALL	.308	.013*WT +	.019*HT +	11.63	.92
PRONASALE TO WALL	.363	.016*WT +	.022*HT +	15.59	.90
SUBNASALE TO WALL	.320	.016*WT +	.015*HT +	15.19	.93
LIP PROTRUS"N-WALL	.271	.016*WT +	.005*HT +	16.45	1.02
MENTON TO WALL	.310	.024*WT -	.013*HT +	17.29	1.08
SAGITTAL CURVATURE	.298	.011*WT +	.053*HT +	24.79	1.42
BITRAGION-CORONAL	.318	.021*WT +	.027*HT +	26.87	1.33
BIOCULAR BREADTH	.247	.005*WT +	.008*HT +	7.74	.48
BIAURICULAR BRDTH	.220	.011*WT +	.008*HT +	13.14	.93
BITRAGION BREADTH	.393	.011*WT +	.002*HT +	11.16	.46
BIZYGOMATIC BRDTH	.358	.012*WT +	.001*HT +	11.21	.54
BIGONIAL BREADTH	.350	.013*WT -	.005*HT +	9.34	.53
NASAL BREADTH	.103	.002*WT -	.001*HT +	3.10	.33
LIP LENGTH	.085	.002*WT +	.002*HT +	3.80	.42
MENTON-SUBNASALE L	.226	.005*WT +	.008*HT +	3.61	.50
MENTON-SELLION LTH	.304	.006*WT +	.018*HT +	6.95	.58
SUBNASALE-SELLION	.198	.002*WT +	.009*HT +	2.83	.40
EAR LENGTH	.282	.007*WT +	.003*HT +	3.86	.43
EAR BREADTH	.144	.002*WT +	.002*HT +	2.40	.33
GRIP STRENGTH	.381	.215*WT +	.301*HT -	10.26	11.62
STATURE REPORTED	.955	.001*WT +	.037*HT +	.35	.07
WEIGHT REPORTED	.964	.090*WT +	.014*HT -	1.19	.42

*WEIGHT IN LBS   STATURE IN CM

TABLE 28

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE* 1977 ARMY WOMEN

VARIABLE	R			SE EST
WEIGHT	1.000	1.000*WT +0.000*HT +	0.00	0.00
STATURE	1.000	0.000*WT +1.000*HT +	0.00	0.00
SHOULDER HEIGHT	.970	.021*WT + .859*HT -	9.27	1.46
AXILLA HEIGHT	.969	.001*WT + .828*HT -	11.81	1.38
BUSTPOINT HEIGHT	.938	-.015*WT + .834*HT -	15.63	1.95
WAIST HEIGHT	.898	-.016*WT + .740*HT -	17.08	2.29
CROTCH HEIGHT	.864	-.019*WT + .609*HT -	20.36	2.20
BUTTOCK HEIGHT	.831	.014*WT + .573*HT -	11.43	2.60
KNEECAP HEIGHT	.848	-.005*WT + .354*HT -	9.13	1.40
CALF HEIGHT	.730	.005*WT + .250*HT -	8.85	1.57
SITTING HEIGHT	.767	.003*WT + .417*HT +	16.73	2.30
EYE HEIGHT/SIT	.739	.002*WT + .389*HT +	9.98	2.34
SHOULDER-ELBOW L	.809	.005*WT + .209*HT -	1.15	1.03
ELBOW-FINGERTIP	.734	.010*WT + .241*HT +	2.92	1.55
KNEE HEIGHT/SIT	.863	.016*WT + .317*HT -	2.78	1.32
POPLITEAL HEIGHT	.849	-.009*WT + .320*HT -	9.27	1.24
BUTTOCK-KNEE LGTH	.846	.070*WT + .249*HT +	8.02	1.63
BUST DEPTH	.790	.106*WT - .108*HT +	26.50	1.36
WAIST DEPTH	.786	.106*WT - .121*HT +	23.99	1.37
CHEST BREADTH	.803	.086*WT - .057*HT +	26.16	1.11
WAIST BREADTH	.765	.110*WT - .077*HT +	23.58	1.58
HIP BREADTH	.805	.107*WT - .014*HT +	23.50	1.46
SHOULDER BREADTH	.823	.101*WT - .030*HT +	33.58	1.27
NECK CIRCUMFERCNCE	.660	.054*WT + .003*HT +	24.73	1.19
SHOULDER CIRCUMFER	.851	.263*WT - .133*HT +	87.29	2.87
CHEST CIRC AT SCYE	.851	.256*WT - .170*HT +	79.40	2.73
BUST CIRCUMFERENCE	.845	.321*WT - .262*HT +	86.47	3.43
CHEST C BELOW BUST	.828	.241*WT - .162*HT +	69.36	2.81
WAIST CIRCUMFERENC	.834	.343*WT - .312*HT +	76.51	3.81
HIP CIRCUMFERENCE	.909	.319*WT - .091*HT +	68.17	2.66
VERTICAL TRUNK CIR	.852	.243*WT + .352*HT +	64.35	3.80
APM CIRC AT SCYE	.826	.110*WT - .032*HT +	28.19	1.36
BICEPS CIRC, FLXD	.864	.119*WT - .110*HT +	29.07	1.16
ELBOW CIRC FLXD	.681	.049*WT + .039*HT +	13.14	1.19
FOREARM CIRC, FLXD	.791	.068*WT - .026*HT +	19.88	.94

*WEIGHT IN LBS STATURE IN CM

TABLE 28 (cont'd)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S
ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE*
1977 ARMY WOMEN

VARIABLE	R				SE EST
WRIST CIRCUMFERENC	.671	.020*WT +	.017*HT +	9.29	.51
UPPER THIGH CIRCUM	.909	.244*WT -	.177*HT +	53.50	1.91
KNEE CIRCUMFERENCE	.823	.099*WT -	.007*HT +	22.88	1.28
CALF CIRCUMFERENCE	.792	.113*WT -	.058*HT +	29.60	1.53
ANKLE CIRCUMFERENC	.643	.039*WT +	.014*HT +	13.30	.96
SHOULDER LENGTH	.381	.004*WT +	.054*HT +	5.67	.98
INTERSCYE BACK	.490	.058*WT +	.009*HT +	28.72	2.05
INTERSCYE FRONT	.584	.047*WT +	.031*HT +	21.90	1.42
BACK ARC, BUST	.788	.148*WT -	.124*HT +	42.61	1.95
BACK ARC, WAIST	.808	.168*WT -	.153*HT +	38.03	2.05
BACK ARC, HIP	.806	.170*WT -	.080*HT +	38.07	2.21
WAIST BACK	.523	.009*WT +	.199*HT +	7.23	2.26
WAIST FRONT	.445	.040*WT +	.086*HT +	17.43	2.35
NECK-BUSTPOINT LGT	.571	.064*WT -	.011*HT +	18.61	1.71
AXILLA-WAIST LEVEL	.286	.002*WT +	.107*HT +	5.40	2.41
SLEEVE INSEAM	.747	-.008*WT +	.312*HT -	4.73	1.74
SLEEVE OUTSEAM	.782	.002*WT +	.351*HT -	3.67	1.85
CROTCH LENGTH	.644	.163*WT +	.102*HT +	34.76	4.18
HEAD CIRCUMFERENCE	.441	.025*WT +	.052*HT +	43.15	1.47
HEAD BREADTH	.320	.009*WT -	.001*HT +	13.59	.51
HEAD LENGTH	.396	.006*WT +	.029*HT +	13.19	.62
PALM LENGTH	.585	.001*WT +	.046*HT +	2.25	.42
HAND BREADTH	.540	.008*WT +	.014*HT +	4.48	.33
HAND CIRCUMFERENCE	.564	.018*WT +	.031*HT +	11.02	.71
HAND LENGTH	.637	.004*WT +	.082*HT +	3.55	.70
INSTEP LENGTH	.660	.012*WT +	.076*HT +	3.88	.74
FOOT LENGTH	.714	.013*WT +	.113*HT +	4.19	.88
HEEL-ANKLE CIRCUMF	.717	.033*WT +	.086*HT +	12.41	1.02
FOOT BREADTH	.525	.010*WT +	.017*HT +	4.77	.44
HEEL BREADTH	.495	.010*WT +	.004*HT +	4.11	.36
FOOT CIRCUMFERENCE	.617	.028*WT +	.039*HT +	12.55	.90
INSTEP CIRCUMFEREM	.615	.032*WT +	.040*HT +	12.73	1.00
ANKLE HEIGHT	.518	-.007*WT +	.090*HT -	2.88	.87
SPHYRION HEIGHT	.402	.001*WT +	.032*HT +	1.12	.50

*WEIGHT IN LBS STATURE IN CM

TABLE 29

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE* COMBINED WOMEN

VARIABLE	R				SE EST
WEIGHT	1.000	1.000*WT	+0.000*HT +	0.00	0.00
STATURE	1.000	0.000*WT	+1.000*HT +	0.00	0.00
SHOULDER HEIGHT	.963	.023*WT +	.852*HT -	8.85	1.55
BUSTPOINT HEIGHT	.930	-.017*WT +	.831*HT -	14.50	1.97
WAIST HEIGHT	.905	-.002*WT +	.706*HT -	13.70	2.06
CROTCH HEIGHT	.848	-.007*WT +	.593*HT -	20.16	2.27
BUTTOCK HEIGHT	.837	.013*WT +	.576*HT -	12.39	2.43
SITTING HEIGHT	.776	.006*WT +	.409*HT +	18.17	2.12
EYE HEIGHT SIT	.736	.007*WT +	.371*HT +	12.50	2.19
POPITEAL HEIGHT	.784	-.003*WT +	.270*HT -	2.17	1.30
BUTTOCK-KNEE LTH	.843	.067*WT +	.245*HT +	9.15	1.52
BUST DEPTH	.740	.100*WT -	.091*HT +	25.21	1.40
WAIST DEPTH	.766	.100*WT -	.097*HT +	20.38	1.28
CHEST BREADTH	.744	.067*WT -	.048*HT +	24.66	1.26
WAIST BREADTH	.758	.106*WT -	.054*HT +	19.81	1.48
HIP BREADTH	.788	.108*WT -	.024*HT +	25.08	1.43
SHOULDER BRDTH	.808	.112*WT -	.049*HT +	35.44	1.34
SHOULDER CIRC	.837	.270*WT -	.131*HT +	86.81	2.86
CHEST CIRC AT SCYE	.832	.265*WT -	.162*HT +	76.87	2.81
BUST CIRC	.804	.310*WT -	.241*HT +	88.22	3.58
CHEST CIRC	.810	.250*WT -	.155*HT +	67.42	2.87
WAIST CIRC	.828	.335*WT -	.253*HT +	66.60	3.55
HIP (BUTTOCH) CIRC	.899	.331*WT -	.130*HT +	73.87	2.67
VERT TRUNK CIRC	.822	.249*WT +	.333*HT +	67.93	3.99
ARM SCYE CIRC	.799	.111*WT -	.028*HT +	27.48	1.41
BICIPS CIRC,FLXD	.857	.129*WT -	.128*HT +	30.96	1.18
FOREARM CIRC,FLXD	.762	.072*WT -	.032*HT +	20.73	.99
WRIST CIRC	.622	.021*WT +	.018*HT +	9.22	.56
UPPER THIGH CIRC	.888	.250*WT -	.179*HT +	52.86	2.03
CALF CIRC	.778	.115*WT -	.056*HT +	28.78	1.50
ANKLE CIRC	.585	.040*WT +	.012*HT +	13.83	1.04
SHOULDER LTH	.384	.006*WT +	.054*HT +	5.25	.97
WAIST BACK	.678	.132*WT -	.089*HT +	39.48	2.27
BACK CURV AT BUST	.556	.002*WT +	.211*HT +	6.11	2.00
NECK-BUSTPOINT LT	.560	.065*WT -	.015*HT +	19.45	1.63

*WEIGHT IN LBS   STATURE IN CM

TABLE 29 (cont'd)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND STATURE* COMBINED WOMEN

VARIABLE	R				SE EST
SLEEVE INSEAM	.726	-.010*WT + .311*HT -		4.72	1.75
HEAD BREADTH	.307	.010*WT - .001*HT +		13.43	.55
HEAD LENGTH	.384	.008*WT + .027*HT +		13.11	.64
HAND BREADTH	.501	.008*WT + .014*HT +		4.36	.35
HAND CIRC	.534	.021*WT + .025*HT +		11.60	.75
HAND LENGTH	.519	.001*WT + .085*HT +		4.06	.89
FOOT LENGTH	.716	.014*WT + .111*HT +		4.33	.83
FOOT BREADTH	.467	.009*WT + .017*HT +		4.94	.45
ANKLE HEIGHT	.365	-.004*WT + .079*HT -		1.27	1.15

*WEIGHT IN LBS   STATURE IN CM

TABLE 30

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING MEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND SITTING HEIGHT*
1966 ARMY MEN

VARIABLE	R		SE EST
WEIGHT	1.000	1.000*WT +0.000*SIT HT + 0.00	0.00
STATURE	.756	.069*WT +1.132*SIT HT + 60.88	4.33
CERVICALE HEIGHT	.709	.079*WT + .939*SIT HT + 51.83	4.47
SHOULDER HEIGHT	.694	.080*WT + .884*SIT HT + 50.82	4.48
WAIST HEIGHT	.525	.056*WT + .557*SIT HT + 46.91	4.57
FUNCTIONAL REACH	.405	.063*WT + .231*SIT HT + 51.63	4.43
CROTCH HEIGHT	.408	.019*WT + .461*SIT HT + 39.11	4.27
PATELLA HEIGHT-TOP	.399	.033*WT + .210*SIT HT + 28.57	2.98
CALF HEIGHT	.290	.026*WT + .087*SIT HT + 23.39	2.58
VERTICAL REACH/SIT	.711	.057*WT + .933*SIT HT + 44.54	4.08
SITTING HEIGHT	1.000	0.000*WT +1.000*SIT HT + 0.00	0.00
EYE HEIGHT/SITTING	.898	.001*WT + .872*SIT HT - .52	1.57
MID-SHOULDER HT/S	.863	.012*WT + .715*SIT HT - 4.38	1.61
KNEE HEIGHT/SITING	.550	.047*WT + .185*SIT HT + 29.81	2.28
POPLITEAL HEIGHT	.319	.005*WT + .202*SIT HT + 25.49	2.37
CHEST DEPTH	.766	.070*WT - .090*SIT HT + 26.20	1.28
CHEST BREADTH/SKIN	.759	.071*WT - .028*SIT HT + 21.82	1.40
HIP BREADTH	.821	.067*WT + .055*SIT HT + 17.55	1.15
OCCIPUT-EX CANTHUS	.245	.011*WT - .004*SIT HT + 15.85	.95
OCCIPUT-TRAGION	.137	.006*WT + .010*SIT HT + 8.41	1.18
HEAD HEIGHT	.300	.005*WT + .046*SIT HT + 8.26	.76
SHOULDER-ELBOW LTH	.509	.025*WT + .153*SIT HT + 19.02	1.60
FOREARM-HAND LTH	.488	.037*WT + .125*SIT HT + 30.74	2.01
BUTTOCK-KNEE LTH	.621	.070*WT + .085*SIT HT + 40.62	2.24
BUTTOCK-POPLITEAL	.460	.046*WT + .052*SIT HT + 37.79	2.22
BIDELTOID DIAMETER	.804	.089*WT - .034*SIT HT + 34.29	1.51
MAX F"ARM-F"ARM BR	.783	.151*WT - .199*SIT HT + 40.00	2.63
HIP BREADTH/SITING	.857	.084*WT + .049*SIT HT + 16.36	1.23
BIZYGOMATIC DIAM	.532	.013*WT - .003*SIT HT + 12.20	.47
BITRAGION DIAMETER	.486	.012*WT + .004*SIT HT + 11.22	.49
HEAD LENGTH	.333	.009*WT + .019*SIT HT + 16.31	.69
OCCIPUT-NASAL ROOT	.315	.008*WT + .018*SIT HT + 16.20	.69
OCCIPUT-PRONASALE	.317	.009*WT + .027*SIT HT + 18.31	.79
HEAD BREADTH	.353	.009*WT + .005*SIT HT + 13.38	.55
INTERPUPILLARY DIS	.242	.004*WT - .012*SIT HT + 6.58	.39

*WEIGHT IN LBS SITTING HEIGHT IN CM

TABLE 30   (cont'd)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING MEN'S
ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND SITTING HEIGHT*
1966 ARMY MEN

VARIABLE	R				SE EST
MENTON-NASAL ROOT	.303	.007*WT + .020*SIT HT +	9.10		.63
HAND LENGTH	.428	.014*WT + .040*SIT HT +	13.18		.87
PALM LENGTH	.352	.008*WT + .015*SIT HT +	7.96		.59
THUMB CROTCH-FFB	.259	.005*WT + .014*SIT HT +	2.90		.50
HAND BREADTH	.458	.008*WT + .018*SIT HT +	5.99		.44
HEEL BREADTH	.554	.012*WT - .020*SIT HT +	6.77		.39
FOOT LENGTH	.525	.022*WT + .077*SIT HT +	16.29		1.11
BALL OF FOOT LTH	.485	.018*WT + .047*SIT HT +	12.52		.91
BALL OF FOOT BR	.502	.011*WT + .015*SIT HT +	6.73		.47
HEAD CIRCUMFERENCE	.466	.030*WT + .026*SIT HT +	48.98		1.42
NECK CIRCUMFERENCE	.724	.067*WT - .050*SIT HT +	31.26		1.43
SHOULDER CIRCUMFER	.850	.242*WT - .182*SIT HT +	91.17		3.37
CHEST CIRCUMFER"CE	.858	.258*WT - .241*SIT HT +	74.58		3.43
WAIST CIRCUMFRNCE	.864	.318*WT - .300*SIT HT +	56.91		4.11
HIP CIRCUMFERENCE	.920	.250*WT - .072*SIT HT +	60.97		2.46
ARM SCYE CIRCUMFER	.707	.102*WT - .068*SIT HT +	34.50		2.30
BICEPS CIRC/EXTEND	.833	.105*WT - .156*SIT HT +	27.78		1.51
WRIST CIRCUMFRNCE	.636	.022*WT + .025*SIT HT +	11.29		.67
HAND CIRCUMFERENCE	.500	.023*WT + .023*SIT HT +	15.86		.98
BICEPS CIRC/FLEXED	.830	.105*WT - .171*SIT HT +	31.07		1.53
FOREARM CIR/FLEXED	.693	.067*WT - .068*SIT HT +	24.93		1.55
WAIST BACK LENGTH	.471	.026*WT + .351*SIT HT +	9.06		3.04
SHOULDER LENGTH	.197	.016*WT + .012*SIT HT +	12.57		1.94
INTERSCYE DISTANCE	.535	.073*WT - .014*SIT HT +	28.75		2.66
INTERSCYE MAXIMUM	.579	.085*WT + .094*SIT HT +	30.59		3.02
SLEEVE LENGTH	.591	.082*WT + .215*SIT HT +	53.30		3.19
SLEEVE INSEAM	.411	.029*WT + .177*SIT HT +	27.92		2.44
VERTICAL TRUNK CIR	.807	.230*WT + .723*SIT HT +	61.95		5.01
UPPER THIGH CIRCUM	.869	.189*WT - .201*SIT HT +	43.59		2.38
LOWER THIGH CIRCUM	.684	.117*WT - .069*SIT HT +	28.01		2.82
CALF CIRCUMFERENCE	.797	.093*WT - .040*SIT HT +	25.44		1.61
ANKLE CIRCUMFRNCE	.588	.040*WT + .038*SIT HT +	12.88		1.04
HEEL-ANKLE CIRCUMF	.639	.041*WT + .054*SIT HT +	22.69		1.27
INSTEP CIRCUMF"NCE	.516	.036*WT + .012*SIT HT +	19.74		1.41
BALL OF FOOT CIRC	.511	.029*WT + .039*SIT HT +	16.87		1.27

*WEIGHT IN LBS   SITTING HEIGHT IN CM

TABLE 31

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING MEN'S
ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND SITTING HEIGHT*
1967 USAF MEN

VARIABLE	R					SE EST
AGE	.164	.051*WT - .265*SIT HT + 45.87				6.22
WEIGHT	1.000	1.000*WT +0.000*SIT HT + 0.00				0.00
SKF SUBSCAP"R-LNGE	.628	.018*WT - .050*SIT HT + 2.90				.41
SKF TRICEPS-LANGE	.572	.015*WT - .037*SIT HT + 2.12				.42
SKF JUX"NIPPLE-LGE	.656	.023*WT - .068*SIT HT + 3.71				.51
SKF MAL XIPH"O-LGE	.689	.021*WT - .063*SIT HT + 3.43				.41
SKF SUPRAILIAC-LGE	.694	.043*WT - .111*SIT HT + 5.49				.84
SKF SUPRAPATELLA-L	.565	.007*WT - .017*SIT HT + 1.10				.19
SKF SUBSCAP"R-HARP	.649	.017*WT - .053*SIT HT + 3.38				.38
SKF TRICEPS-HARP"N	.601	.014*WT - .036*SIT HT + 2.16				.35
SKF SUPRAILIAC-HPN	.677	.037*WT - .096*SIT HT + 4.94				.76
GRIP STRENGTH	.386	.237*WT + .730*SIT HT + 15.18				15.43
HEIGHT (STATURE)	.806	.057*WT +1.355*SIT HT + 41.20				3.66
CERVICALE HEIGHT	.763	.067*WT +1.133*SIT HT + 34.87				3.75
ACROMION HEIGHT	.754	.078*WT +1.041*SIT HT + 34.68				3.78
RADIALE HEIGHT	.763	.063*WT + .838*SIT HT + 23.28				2.95
STYLION HEIGHT	.722	.046*WT + .714*SIT HT + 12.06				2.72
DACTYLION HEIGHT	.682	.038*WT + .604*SIT HT + 4.30				2.57
SUPRASTERNALE HGHT	.769	.072*WT +1.034*SIT HT + 36.36				3.51
NIPPLE HEIGHT	.708	.053*WT + .959*SIT HT + 30.70				3.69
WAIST HT-OMPHALION	.606	.044*WT + .726*SIT HT + 31.19				3.75
ILIOCRISTALE HT	.611	.074*WT + .584*SIT HT + 41.90				3.80
BUTTOCK HEIGHT	.535	.061*WT + .453*SIT HT + 37.32				3.70
TROCHANTERION HGHT	.537	.050*WT + .516*SIT HT + 37.21				3.67
GLUTEAL FURROW HGT	.512	.046*WT + .441*SIT HT + 32.05				3.44
CROTCH HEIGHT	.484	.037*WT + .477*SIT HT + 34.21				3.63
PATELLA TOP HEIGHT	.537	.035*WT + .270*SIT HT + 21.38				2.15
KNEE CIRC HEIGHT	.544	.035*WT + .263*SIT HT + 19.07				2.09
FIBULAR HEIGHT	.526	.028*WT + .244*SIT HT + 16.27				1.92
CALF HEIGHT	.472	.029*WT + .192*SIT HT + 12.63				1.96
ANKLE HEIGHT	.287	.006*WT + .081*SIT HT + 5.13				1.10
SITTING HEIGHT	1.000	0.000*WT +1.000*SIT HT + 0.00				0.00
EYE HEIGHT/SITTING	.930	-.001*WT + .891*SIT HT - 1.90				1.10
MIDSHOULDER HT/SIT	.877	.018*WT + .695*SIT HT - 3.29				1.32
ACROMION H"GHT/SIT	.823	.019*WT + .671*SIT HT - 4.77				1.62

*WEIGHT IN LBS SITTING HEIGHT IN CM

TABLE 31   (cont'd)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING MEN'S
ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND SITTING HEIGHT*
1967 USAF MEN

VARIABLE	R		SE EST
ELBOW REST HGT/SIT	.563	.001*WT + .459*SIT HT - 17.78	2.15
KNEE HEIGHT/SITT"G	.618	.045*WT + .267*SIT HT + 23.08	1.96
POPLITEAL HGHT/SIT	.492	.010*WT + .311*SIT HT + 12.99	1.95
BUTTOCK-KNEE LNGTH	.646	.073*WT + .109*SIT HT + 37.58	2.06
BUTTOCK-POPLITEAL	.575	.061*WT + .098*SIT HT + 30.66	2.10
ACRM-BICEP CIR LVL	.355	.013*WT + .109*SIT HT + 6.59	1.41
SHOULDER-ELBOW LTH	.505	.019*WT + .188*SIT HT + 15.13	1.48
ACROMION-RADIALE L	.479	.019*WT + .170*SIT HT + 13.81	1.49
ELBOW-WRIST LENGTH	.497	.018*WT + .138*SIT HT + 14.01	1.22
RADIALE-STYLION LH	.456	.019*WT + .111*SIT HT + 13.24	1.26
ELBOW-GRIP LENGTH	.512	.019*WT + .177*SIT HT + 15.42	1.39
THUMB-TIP REACH	.485	.053*WT + .356*SIT HT + 37.94	3.48
THUMB-TIP R"CH/XTD	.455	.054*WT + .396*SIT HT + 43.32	4.02
SLEEVE INSEAM	.409	.015*WT + .273*SIT HT + 20.50	2.34
BIACROMIAL BREADTH	.479	.033*WT + .110*SIT HT + 24.75	1.70
BIDELTOID BREADTH	.801	.101*WT - .086*SIT HT + 38.72	1.53
CHEST BREADTH	.762	.081*WT - .105*SIT HT + 28.51	1.37
WAIST BROTH-OMPH"N	.873	.106*WT - .163*SIT HT + 27.75	1.16
BICRISTALE BREADTH	.656	.067*WT - .071*SIT HT + 22.91	1.54
HIP BREADTH	.809	.071*WT + .004*SIT HT + 22.57	1.11
HIP BREADTH SITT"G	.857	.095*WT - .052*SIT HT + 26.15	1.18
ELBOW BROTH BONE/R	.485	.006*WT + .024*SIT HT + 3.81	.32
ELBOW BROTH BONE/L	.509	.006*WT + .026*SIT HT + 3.63	.30
F"ARM-F"ARM BR"DTH	.729	.142*WT - .254*SIT HT + 53.34	2.59
KNEE BR"DTH BONE/R	.655	.011*WT + .031*SIT HT + 5.18	.34
KNEE BR"DTH BONE/L	.662	.011*WT + .033*SIT HT + 4.98	.34
CHEST DEPTH	.798	.079*WT - .165*SIT HT + 26.19	1.16
WAIST DEPTH-OMPH"N	.802	.091*WT - .208*SIT HT + 25.89	1.30
BUTTOCK DEPTH	.839	.088*WT - .143*SIT HT + 22.02	1.11
THIGH CLEARANCE HT	.793	.055*WT - .080*SIT HT + 14.43	.84
NECK CIRC -MAXIMUM	.704	.066*WT - .055*SIT HT + 32.01	1.36
SHOULDER CIRCUM"CE	.837	.239*WT - .204*SIT HT + 95.21	3.18
CHEST CIRC AT SCYE	.829	.255*WT - .377*SIT HT + 93.12	3.39
CHEST CIRCUMF"ENCE	.865	.282*WT - .528*SIT HT + 98.80	3.19
WAIST CIR-OMPHAL"N	.893	.339*WT - .658*SIT HT + 90.07	3.32

*WEIGHT IN LBS SITTING HEIGHT IN CM

TABLE 31 (cont'd)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING MEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND SITTING HEIGHT*
1967 USAF MEN

VARIABLE	R						SE EST
WAIST CIR-OMPH/SIT	.866	.336*WT	- .725*SIT HT	+	96.63		3.75
BUTTOCK CIRCUMF"CE	.926	.248*WT	- .161*SIT HT	+	70.57		2.08
BUTTOCK CIRCUM/SIT	.895	.297*WT	- .267*SIT HT	+	80.96		3.00
VERTICAL TRUNK CIR	.895	.215*WT	+ .892*SIT HT	+	47.63		3.19
VERT TRUNK CIR/SIT	.866	.178*WT	+1.013*SIT HT	+	36.01		3.48
SCROTALE-ANT WAIST	.545	.031*WT	+ .204*SIT HT	+	4.05		1.73
SCROTALE-A WAIST/S	.551	.009*WT	+ .263*SIT HT	-	.63		1.42
SCRTL-SUPRASTERNLE	.756	.076*WT	+ .442*SIT HT	+	14.47		2.23
SCRTL-SUPRSTRNLE/S	.755	.034*WT	+ .577*SIT HT	+	3.90		1.96
SCRTL-ANT SCYE LVL	.704	.051*WT	+ .469*SIT HT	+	1.26		2.23
SCRTL-ANT SCYE L/S	.677	.0C8*WT	+ .603*SIT HT	-	9.1U		2.17
SCRTL-A MIDSHOULDR	.795	.096*WT	+ .434*SIT HT	+	20.26		2.26
SCRTL-A MDSHLDR/S	.763	.053*WT	+ .557*SIT HT	+	11.25		2.12
SCROTALE-PST WAIST	.616	.082*WT	+ .029*SIT HT	+	18.42		2.31
SCRTL-WAIST OVR BK	.600	.075*WT	+ .117*SIT HT	+	18.70		2.42
SCROTALE-P WAIST/S	.499	.065*WT	+ .093*SIT HT	+	16.60		2.70
SCRTL-WAIST/BUTT/S	.525	.062*WT	+ .116*SIT HT	+	17.95		2.48
SCROTALE-CERVICALE	.776	.097*WT	+ .477*SIT HT	+	21.35		2.50
SCROTALE-CERVCLE/S	.758	.094*WT	+ .475*SIT HT	+	23.67		2.59
SCRTL-PST SCYE LVL	.690	.076*WT	+ .391*SIT HT	+	12.55		2.58
SCRTL-PST SCYE L/S	.667	.075*WT	+ .377*SIT HT	+	16.42		2.68
SCRTL-P MIDSHOULDR	.799	.114*WT	+ .410*SIT HT	+	27.35		2.45
SCRTL-MDSHLD OVR B	.783	.103*WT	+ .504*SIT HT	+	26.61		2.59
SCRTL-P MDSHLDR/S	.766	.115*WT	+ .388*SIT HT	+	31.18		2.69
SCRTL-MDSHLD O B/S	.776	.106*WT	+ .449*SIT HT	+	29.02		2.59
UPPER THIGH CIRCUM	.877	.196*WT	- .273*SIT HT	+	50.23		2.13
UPPER THIGH C/SIT	.899	.193*WT	- .263*SIT HT	+	48.88		1.87
KNEE CIRCUMFERENCE	.848	.082*WT	+ .001*SIT HT	+	24.35		1.10
KNEE CIRCUM"CE/SIT	.855	.086*WT	- .016*SIT HT	+	25.86		1.10
CALF CIRCUMF/RIGHT	.788	.U89*WT	- .097*SIT HT	+	30.78		1.40
CALF CIRCUMF/LEFT	.793	.088*WT	- .085*SIT HT	+	29.58		1.36
ANKLE CIRCUMF"ENCE	.694	.040*WT	+ .007*SIT HT	+	14.81		.91
SCYE CIRCUMFERENCE	.741	.097*WT	- .020*SIT HT	+	33.39		1.86
BICEPS C-EXTEND/RT	.823	.098*WT	- .16E*SIT HT	+	29.24		1.33
BICEPS C-EXTEND/LT	.836	.100*WT	- .180*SIT HT	+	29.80		1.28

*WEIGHT IN LBS SITTING HEIGHT IN CM

TABLE 31 (cont'd)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING MEN'S
ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND SITTING HEIGHT*
1967 USAF MEN

VARIABLE	R			SE EST
BICEPS C-FLEXED/RT	.792	.090*WT - .128*SIT HT +	29.05	1.38
BICEPS C-FLEXED/LT	.806	.092*WT - .137*SIT HT +	28.91	1.33
ELBOW CIR-EXTENDED	.782	.053*WT - .004*SIT HT +	18.84	.89
ELBOW CIRC-FLEXED	.599	.047*WT + .031*SIT HT +	20.19	1.40
LOWER ARM C-EXTEND	.790	.055*WT - .021*SIT HT +	20.56	.90
LOWER ARM C-FLEXED	.714	.053*WT - .010*SIT HT +	21.50	1.11
WRIST CIRCUMF"ENCE	.594	.023*WT + .030*SIT HT +	10.80	.74
SLVE L/SPINE-SCYE	.529	.043*WT + .029*SIT HT +	18.28	1.54
SLVE L/SPINE-ELBOW	.612	.054*WT + .220*SIT HT +	30.70	2.07
SLVE L/SPINE-WRIST	.642	.072*WT + .344*SIT HT +	46.27	2.70
ANTERIOR NECK LGTH	.489	-.032*WT + .271*SIT HT -	11.26	1.47
POSTERIOR NECK LTH	.336	-.017*WT + .197*SIT HT -	2.16	1.58
SHOULDER LENGTH	.331	.011*WT + .079*SIT HT +	7.33	1.19
DELTOID ARC	.367	.012*WT + .096*SIT HT +	4.88	1.24
INTERSCYE	.422	.082*WT - .175*SIT HT +	40.82	3.41
INTERSCYE MAXIMUM	.684	.089*WT + .101*SIT HT +	36.68	2.20
WAIST FRONT-OMPH"N	.633	.044*WT + .221*SIT HT +	12.18	1.71
CROTCH LGTH-OMPH"N	.734	.137*WT + .186*SIT HT +	29.49	3.01
WAIST BACK-OMPHL"N	.681	.015*WT + .456*SIT HT +	1.82	1.74
FOOT LENGTH	.556	.018*WT + .125*SIT HT +	12.26	.99
INSTEP LENGTH	.508	.014*WT + .081*SIT HT +	9.81	.82
FOOT BREADTH	.494	.008*WT + .034*SIT HT +	5.21	.43
BALL-OF-FOOT CIRC	.575	.027*WT + .069*SIT HT +	13.73	1.01
INSTEP CIRCUMF"NCE	.628	.032*WT + .046*SIT HT +	15.85	.94
HEEL CIRCUMFERENCE	.699	.037*WT + .108*SIT HT +	17.46	1.01
BI-MALLEOLAR BRDTH	.536	.007*WT + .031*SIT HT +	3.22	.32
LAT"L MALLEOLUS HT	.388	.006*WT + .037*SIT HT +	2.55	.50
MED"L MALLEOLUS HT	.434	.005*WT + .057*SIT HT +	2.39	.51
HAND LENGTH	.495	.009*WT + .089*SIT HT +	9.25	.71
PALM LENGTH	.411	.005*WT + .046*SIT HT +	5.67	.49
HAND BR/METACARPLE	.483	.007*WT + .026*SIT HT +	5.26	.36
HAND BRTH AT THUMB	.503	.008*WT + .036*SIT HT +	5.45	.43
HAND C/METACARPALE	.534	.019*WT + .052*SIT HT +	13.41	.79
HAND C ROUND THUMB	.614	.026*WT + .061*SIT HT +	15.55	.85
HAND THICK/META-3	.276	.002*WT + .007*SIT HT +	1.77	.20

*WEIGHT IN LBS SITTING HEIGHT IN CM

TABLE 31 (cont'd)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING MEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND SITTING HEIGHT* 1967 USAF MEN

VARIABLE	R				SE EST
HEAD CIRCUMFERENCE	.426	.024*WT +	.056*SIT HT +	48.13	1.29
SAGITTAL ARC/INION	.199	.004*WT +	.089*SIT HT +	25.66	1.62
MINIMUM FRONTL ARC	.200	.008*WT -	.006*SIT HT +	12.77	.77
BITRAGION-CORONAL	.341	.013*WT +	.072*SIT HT +	26.79	1.18
BITRAGN-MIN FRNTAL	.373	.015*WT +	.029*SIT HT +	25.49	.92
BITRAG"N-SUBNASALE	.466	.022*WT +	.003*SIT HT +	25.21	.90
BITRAGION-MENTON	.547	.029*WT +	.029*SIT HT +	24.91	1.03
BIT-SUBMANDIBULAR	.536	.037*WT +	.029*SIT HT +	21.85	1.33
BITRAG"N-POSTERIOR	.302	.020*WT +	.016*SIT HT +	24.48	1.43
HEAD LENGTH	.296	.006*WT +	.034*SIT HT +	15.66	.64
HEAD DIAGNL/MENTON	.459	.009*WT +	.067*SIT HT +	17.80	.67
HD DIAG/INION-NOSE	.256	.010*WT +	.024*SIT HT +	17.96	.98
EAR BREADTH	.192	.002*WT +	.007*SIT HT +	2.80	.30
EAR LENGTH	.300	.005*WT +	.012*SIT HT +	4.61	.41
EAR L ABVE TRAGION	.105	.001*WT +	.005*SIT HT +	2.30	.29
HEAD BREADTH	.305	.008*WT -	.001*SIT HT +	14.30	.52
MAXIMUM FRONTAL BR	.303	.006*WT +	.008*SIT HT +	9.81	.43
BITRAGION BREADTH	.398	.011*WT -	.004*SIT HT +	12.72	.51
BIZYGOMATIC BR"DTH	.454	.011*WT -	.004*SIT HT +	12.69	.46
BIGONIAL BREADTH	.422	.015*WT -	.019*SIT HT +	10.90	.63
EAR-TO-EAR BREADTH	.284	.008*WT +	.026*SIT HT +	15.02	.77
BIOCULAR BREADTH	.189	.004*WT +	.002*SIT HT +	8.29	.48
INTERPUPILLARY BRD	.183	.003*WT +	0.000*SIT HT +	5.75	.36
INTEROCULAR BR"DTH	.165	.002*WT -	.004*SIT HT +	3.36	.27
NOSE BREADTH	.202	.003*WT -	.006*SIT HT +	3.58	.29
LIP LENGTH	.176	.003*WT +	.004*SIT HT +	4.34	.37
EAR PROTRUSION	.130	.001*WT +	.007*SIT HT +	1.34	.33
SUBNASALE-NASAL RT	.166	.001*WT +	.019*SIT HT +	3.19	.37
PHILTRUM LENGTH	.131	.002*WT +	.001*SIT HT +	1.11	.27
LIP-TO-LIP LENGTH	.090	-.001*WT +	.008*SIT HT +	1.16	.38
MENTON-SUBNASALE L	.190	.003*WT +	.017*SIT HT +	4.80	.52
MENTON-NASAL ROOT	.283	.004*WT +	.036*SIT HT +	7.98	.58
GLABELLA-TO-VERTEX	.152	-.002*WT +	.052*SIT HT +	4.78	.96
NASAL ROOT-TO-VRTX	.200	0.000*WT +	.063*SIT HT +	4.88	.92
XTRNL CANTHUS-VRTX	.214	0.000*WT +	.052*SIT HT +	7.10	.75

*WEIGHT IN LBS SITTING HEIGHT IN CM

TABLE 31 (concluded)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING MEN'S
ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND SITTING HEIGHT*
1967 USAF MEN

VARIABLE	R					SE EST
PRONASALE-TO-VRTX	.221	-.002*WT +	.084*SIT	HT +	7.26	1.08
SUBNASALE-TO-VRTX	.257	-.001*WT +	.088*SIT	HT +	8.06	.99
STOMION-TO-VERTEX	.271	0.000*WT +	.089*SIT	HT +	10.07	.96
MENTON-TO-VERTEX	.303	.002*WT +	.092*SIT	HT +	13.85	.98
TRAGION-TO-VERTEX	.231	.002*WT +	.035*SIT	HT +	9.84	.59
GLABELLA-TO-WALL	.317	.006*WT +	.037*SIT	HT +	15.86	.64
NASAL ROOT-TO-WALL	.312	.006*WT +	.035*SIT	HT +	15.86	.62
XTRNL CANTHUS-WALL	.232	.006*WT +	.017*SIT	HT +	15.16	.64
PRONASALE-TO-WALL	.313	.009*WT +	.027*SIT	HT +	18.60	.71
SUBNASALE-TO-WALL	.286	.009*WT +	.017*SIT	HT +	17.84	.75
LIP PROMIN"CE-WALL	.292	.011*WT +	.008*SIT	HT +	18.51	.82
CHIN PROMINCE-WALL	.329	.016*WT +	0.000*SIT	HT +	17.70	.99
TRAGION-TO-WALL	.138	.004*WT +	.007*SIT	HT +	8.99	.64
GUESSED HEIGHT	.773	.065*WT +	1.212*SIT	HT +	55.05	3.82
GUESSED WEIGHT	.975	.869*WT +	.385*SIT	HT -	13.17	4.34

*WEIGHT IN LBS   SITTING HEIGHT IN CM

TABLE 32

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING MEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND SITTING HEIGHT*
COMBINED MEN

VARIABLE	R						SE EST
WEIGHT	1.000	1.000*WT	+0.000*SIT HT	+	0.00		0.00
HEIGHT (STATURE)	.774	.063*WT	+1.150*SIT HT	+	59.95		4.19
ACROMION HEIGHT	.699	.073*WT	+ .865*SIT HT	+	53.20		4.39
CERVICALE HEIGHT	.728	.074*WT	+ .951*SIT HT	+	51.29		4.32
SITTING HEIGHT	1.000	0.000*WT	+1.000*SIT HT	+	0.00		0.00
MIDSHOULDER HT/SIT	.878	.014*WT	+ .718*SIT HT	−	4.91		1.54
ANKLE CIRCUMF"ENCE	.633	.037*WT	+ .007*SIT HT	+	15.95		1.08
SCYE CIRCUMFERENCE	.731	.109*WT	+ .005*SIT HT	+	27.35		2.43
BICEPS C-FLEXED/RT	.817	.100*WT	− .178*SIT HT	+	32.36		1.52
BIDELTOID BREADTH	.810	.097*WT	− .001*SIT HT	+	30.42		1.67
BUTTOCK CIRCUMF"CE	.926	.253*WT	− .063*SIT HT	+	59.91		2.40
BUTTOCK-KNEE LNGTH	.635	.069*WT	+ .083*SIT HT	+	40.89		2.20
CALF CIRCUMF/RIGHT	.790	.090*WT	− .068*SIT HT	+	28.31		1.58
CALF HEIGHT	.318	.025*WT	+ .096*SIT HT	+	22.61		2.45
CHEST BREADTH	.773	.077*WT	− .010*SIT HT	+	19.53		1.49
CHEST CIRCUMF"ENCE	.866	.268*WT	− .253*SIT HT	+	74.48		3.47
CROTCH HEIGHT	.435	.022*WT	+ .457*SIT HT	+	38.91		4.11
BIZYGOMATIC BR"DTH	.536	.013*WT	− .002*SIT HT	+	12.12		.47
FOOT LENGTH	.528	.020*WT	+ .080*SIT HT	+	16.28		1.08
LOWER ARM C-FLEXED	.689	.063*WT	− .069*SIT HT	+	25.56		1.46
HAND BR/METACARPLE	.440	.007*WT	+ .016*SIT HT	+	6.30		.42
HAND C/METACARPALE	.477	.021*WT	+ .018*SIT HT	+	16.53		.96
HAND LENGTH	.425	.012*WT	+ .044*SIT HT	+	13.08		.84
HEAD BREADTH	.388	.009*WT	+ .009*SIT HT	+	13.07		.55
HEAD CIRCUMFERENCE	.514	.032*WT	+ .055*SIT HT	+	46.25		1.44
HEAD LENGTH	.373	.009*WT	+ .028*SIT HT	+	15.55		.69
HIP BREADTH	.832	.071*WT	+ .070*SIT HT	+	15.79		1.21
INSTEP CIRCUMF"NCE	.436	.030*WT	− .018*SIT HT	+	23.08		1.43
INSTEP LENGTH	.483	.016*WT	+ .047*SIT HT	+	12.78		.90
INTERPUPILLARY BRD	.250	.005*WT	− .006*SIT HT	+	5.90		.38
INTERSCYE	.469	.071*WT	− .083*SIT HT	+	35.02		2.94
MENTON-NASAL ROOT	.281	.006*WT	+ .019*SIT HT	+	9.32		.62
PALM LENGTH	.390	.008*WT	+ .023*SIT HT	+	7.25		.57
PATELLA TOP HEIGHT	.391	.030*WT	+ .190*SIT HT	+	30.55		2.84
POPLITEAL HGHT/SIT	.286	.002*WT	+ .184*SIT HT	+	27.23		2.36

*WEIGHT IN LBS SITTING HEIGHT IN CM

TABLE 32   cont'd)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING MEN'S
ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND SITTING HEIGHT*
COMBINED MEN

VARIABLE	R			SE EST
SHOULDER CIRCUM"CE	.857	.246*WT − .148*SIT HT + 87.81		3.37
SHOULDER-ELBOW LTH	.394	.018*WT + .117*SIT HT + 23.00		1.72
SHOULDER LENGTH	.232	.015*WT + .029*SIT HT + 11.21		1.78
SLEEVE INSEAM	.381	.023*WT + .173*SIT HT + 29.02		2.45
UPPER THIGH CIRCUM	.878	.194*WT − .183*SIT HT + 41.43		2.37
WAIST CIR-OMPHAL"N	.872	.334*WT − .279*SIT HT + 53.30		4.21
ILIOCRISTALE HT	.577	.062*WT + .580*SIT HT + 43.99		4.38

*WEIGHT IN LBS   SITTING HEIGHT IN CM

TABLE 33

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND SITTING HEIGHT* 1968 USAF WOMEN

VARIABLE	R					SE EST
AGE	.224	.091*WT	- .043*SIT	HT +	15.53	6.29
WEIGHT	1.000	1.000*WT	+0.000*SIT	HT +	0.00	.00
TRICEPS SKINFOLD	.632	.023*WT	- .040*SIT	HT +	2.40	.42
SUBSCAPULAR SKINFO	.630	.021*WT	- .048*SIT	HT +	2.72	.38
SUPRAILIAC SKINFLO	.621	.030*WT	- .054*SIT	HT +	2.78	.55
MEDIAL CALF SKINFO	.393	.014*WT	- .027*SIT	HT +	2.12	.48
STATURE	.818	.069*WT	+1.342*SIT	HT +	38.45	3.45
STATURE, MAXIMUM	.820	.069*WT	+1.351*SIT	HT +	38.32	3.45
CERVICALE HEIGHT	.780	.077*WT	+1.116*SIT	HT +	33.87	3.46
ACROMIAL HEIGHT	.765	.086*WT	+1.043*SIT	HT +	31.63	3.53
SUPRASTERNALE HGHT	.776	.081*WT	+1.040*SIT	HT +	32.67	3.34
BUST POINT HEIGHT	.690	.054*WT	+ .971*SIT	HT +	28.33	3.77
WAIST HEIGHT	.650	.072*WT	+ .680*SIT	HT +	32.91	3.42
ABDOMINAL EXT HGT	.589	.056*WT	+ .639*SIT	HT +	31.33	3.57
TROCHANTERIC HGHT	.563	.072*WT	+ .500*SIT	HT +	30.71	3.53
BUTTOCK HEIGHT	.552	.077*WT	+ .439*SIT	HT +	34.83	3.47
GLUTEAL FURROW HGT	.477	.047*WT	+ .437*SIT	HT +	29.31	3.48
TIBIALE HEIGHT	.502	.035*WT	+ .250*SIT	HT +	16.13	2.05
CROTCH HEIGHT	.523	.065*WT	+ .430*SIT	HT +	29.42	3.43
ANKLE HEIGHT	.220	.006*WT	+ .075*SIT	HT +	4.00	1.32
LAT'L MALLEOLUS HT	.347	.004*WT	+ .051*SIT	HT +	1.90	.55
SITTING HT,RELAXED	.968	-.003*WT	+1.003*SIT	HT -	1.20	.81
SITTING HEIGHT	1.000	0.000*WT	+1.000*SIT	HT +	0.00	.00
EYE HEIGHT,SITTING	.928	0.000*WT	+ .894*SIT	HT -	2.82	1.14
MIDSHOULDER HT,SIT	.885	.015*WT	+ .700*SIT	HT -	3.83	1.24
WAIST HGHT,SITTING	.573	.016*WT	+ .264*SIT	HT -	1.27	1.42
ELBOW REST HEIGHT	.558	-.019*WT	+ .473*SIT	HT -	15.36	2.04
POPLITEAL HEIGHT	.447	.026*WT	+ .168*SIT	HT +	23.36	1.66
BUTTOCK-POPLIT'L L	.568	.089*WT	+ .056*SIT	HT +	31.59	2.27
BUTTOCK-KNEE LNGTH	.703	.101*WT	+ .105*SIT	HT +	35.58	1.87
ACROMION-RADIALE L	.517	.029*WT	+ .158*SIT	HT +	13.79	1.39
RADIALE-STYLION L	.438	.021*WT	+ .111*SIT	HT +	11.21	1.23
THUMB-TIP REACH	.481	.074*WT	+ .294*SIT	HT +	39.55	3.40
THUMB-TIP,EXTENDED	.489	.084*WT	+ .433*SIT	HT +	36.08	4.26
OVERHEAD REACH	.652	.127*WT	+1.343*SIT	HT +	68.10	6.49

*WEIGHT IN LBS   SITTING HEIGHT IN CM

TABLE 33 (cont'd)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY HEIGHT AND SITTING HEIGHT* 1968 USAF WOMEN

VARIABLE	R		SE EST
NECK CIRCUMFERENCE	.584	.056*WT + .031*SIT HT + 23.97	1.36
SHOULDER CIRCUMFER	.841	.276*WT - .189*SIT HT + 81.46	2.78
CHEST CIRC AT SCYE	.812	.260*WT - .213*SIT HT + 69.39	2.90
BUST CIRCUMFERENCE	.816	.306*WT - .341*SIT HT + 79.97	3.29
CHEST C BELOW BUST	.802	.253*WT - .234*SIT HT + 62.15	2.91
WAIST CIRCUMFERNCE	.845	.305*WT - .361*SIT HT + 59.28	2.93
ABDOMINAL EXT CIRC	.809	.386*WT - .405*SIT HT + 71.18	4.28
HIP C-7""BLW WAIST	.897	.318*WT - .193*SIT HT + 69.68	2.47
HIP C-9""BLW WAIST	.887	.331*WT - .107*SIT HT + 62.30	2.78
UPPER THIGH CIRCUM	.855	.235*WT - .234*SIT HT + 45.59	2.19
KNEE CIRCUMFERENCE	.820	.114*WT - .026*SIT HT + 24.02	1.30
CALF CIRCUM, RIGHT	.755	.106*WT - .045*SIT HT + 24.50	1.47
CALF CIRCUM, LEFT	.749	.107*WT - .043*SIT HT + 24.29	1.51
ANKLE CIRCUMFERNCE	.601	.041*WT + .049*SIT HT + 11.67	1.03
VERTICAL TRUNK CIR	.871	.241*WT + .924*SIT HT + 44.66	3.37
VERTICAL TRK C,SIT	.876	.189*WT +1.118*SIT HT + 30.31	3.16
BUTTOCK CIRC, SIT	.906	.343*WT - .124*SIT HT + 66.95	2.58
SCYE CIRCUMFERENCE	.777	.110*WT - .032*SIT HT + 25.84	1.44
AXILLARY ARM CIRC	.820	.128*WT - .173*SIT HT + 25.95	1.34
BICEPS C,RELAXED,R	.838	.129*WT - .198*SIT HT + 26.14	1.25
BICEPS C,FLEXED, R	.838	.130*WT - .191*SIT HT + 26.60	1.26
BICEPS C,RELAXED,L	.846	.137*WT - .220*SIT HT + 27.06	1.28
BICEPS C,FLEXED, L	.840	.135*WT - .205*SIT HT + 26.90	1.29
ELBOW CIRC, FLEXED	.575	.058*WT + .039*SIT HT + 16.26	1.46
FOREARM C, RELAXED	.814	.072*WT - .050*SIT HT + 18.59	.80
FOREARM C, FLEXED	.785	.076*WT - .052*SIT HT + 19.75	.94
WRIST CIRCUMFERNCE	.659	.025*WT + .034*SIT HT + 8.87	.54
BIACROMIAL BREADTH	.522	.040*WT + .098*SIT HT + 22.36	1.40
BIDELTOID BREADTH	.805	.120*WT - .090*SIT HT + 34.30	1.37
CHEST BREADTH	.704	.085*WT - .046*SIT HT + 21.11	1.36
BUST PT-BUST PT BR	.600	.061*WT - .072*SIT HT + 16.93	1.24
WAIST BREADTH	.775	.096*WT - .072*SIT HT + 18.07	1.22
HIP BREADTH	.770	.102*WT + .008*SIT HT + 21.30	1.41
THIGH-THIGH BR,SIT	.787	.142*WT - .079*SIT HT + 26.88	1.76
HUMERAL BREADTH, R	.577	.008*WT + .023*SIT HT + 3.15	.25

*WEIGHT IN LBS SITTING HEIGHT IN CM

TABLE 33   (cont'd)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S
ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND SITTING HEIGHT*
1968 USAF WOMEN

VARIABLE	R							SE EST
HUMERAL BREADTH, L	.580	.008*WT	+	.022*SIT HT	+	3.20		.25
FEMORAL BREADTH, R	.495	.012*WT	+	.015*SIT HT	+	5.30		.39
FEMORAL BREADTH, L	.521	.012*WT	+	.013*SIT HT	+	5.50		.37
CHEST DEPTH	.767	.099*WT	-	.129*SIT HT	+	22.08		1.24
WAIST DEPTH	.765	.086*WT	-	.123*SIT HT	+	16.60		1.08
ABDOMINAL EXT DPTH	.825	.117*WT	-	.177*SIT HT	+	21.15		1.20
BUTTOCK DEPTH	.825	.098*WT	-	.117*SIT HT	+	18.69		1.01
THIGH CLEARANCE	.714	.055*WT	-	.011*SIT HT	+	6.38		.88
SHOULDER LENGTH	.338	.010*WT	+	.073*SIT HT	+	7.14		.96
NECK-BUST POINT L	.573	.064*WT	+	.013*SIT HT	+	16.24		1.55
STRAP LENGTH	.656	.149*WT	+	.068*SIT HT	+	40.44		2.96
INTERSCYE	.539	.084*WT	-	.062*SIT HT	+	29.67		2.06
INTERSCYE, MAXIMUM	.556	.103*WT	+	.072*SIT HT	+	36.12		2.73
BACK CURVATURE	.610	.119*WT	-	.076*SIT HT	+	33.50		2.42
WAIST BACK	.657	-.002*WT	+	.467*SIT HT	+	.79		1.67
ANTERIOR WAIST LTH	.579	.031*WT	+	.249*SIT HT	+	8.32		1.63
SLEEVE INSEAM	.405	.019*WT	+	.248*SIT HT	+	20.48		2.21
SPINE-TO-SCYE LGTH	.432	.033*WT	+	.021*SIT HT	+	14.37		1.22
SPINE-TO-ELBOW LTH	.624	.062*WT	+	.222*SIT HT	+	26.42		1.88
SPINE-TO-WRIST LTH	.623	.085*WT	+	.311*SIT HT	+	42.14		2.60
HAND LENGTH	.464	.014*WT	+	.091*SIT HT	+	6.81		.85
HAND BREADTH	.439	.008*WT	+	.019*SIT HT	+	4.91		.35
HAND CIRCUMFERENCE	.503	.024*WT	+	.030*SIT HT	+	12.70		.78
FOOT LENGTH	.592	.023*WT	+	.122*SIT HT	+	16.70		.91
FOOT BREADTH	.404	.010*WT	+	.017*SIT HT	+	6.14		.46
HEAD LENGTH	.337	.009*WT	+	.036*SIT HT	+	14.18		.64
HEAD BREADTH	.290	.010*WT	+	0.000*SIT HT	+	13.24		.57
HEAD CIRCUMFERENCE	.419	.033*WT	+	.067*SIT HT	+	44.93		1.47
TRAGION-TOP HEAD	.264	.007*WT	+	.039*SIT HT	+	8.50		.74
ECTOCANTHUS-TOP HD	.224	.005*WT	+	.049*SIT HT	+	6.93		.90
PRONASALE-TOP HEAD	.231	.003*WT	+	.075*SIT HT	+	7.95		1.14
SUBNASALE-TOP HEAD	.276	.005*WT	+	.081*SIT HT	+	8.34		1.06
STOMION-TOP HEAD	.273	.005*WT	+	.081*SIT HT	+	10.26		1.08
MENTON-TOP HEAD	.347	.011*WT	+	.089*SIT HT	+	12.89		1.07
TRAGION TO WALL	.205	.011*WT	+	.006*SIT HT	+	6.26		.88

*WEIGHT IN LBS   SITTING HEIGHT IN CM

TABLE 33 (concluded)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND SITTING HEIGHT*
1968 USAF WOMEN

VARIABLE	R						SE EST
ECTOCANTHUS-WALL	.295	.015*WT +	.017*SIT	HT +	13.00		.92
PRONASALE TO WALL	.350	.018*WT +	.022*SIT	HT +	17.01		.90
SUBNASALE TO WALL	.311	.018*WT +	.002*SIT	HT +	17.20		.93
LIP PROTRUS"N-WALL	.276	.019*WT -	.021*SIT	HT +	18.68		1.02
MENTON TO WALL	.321	.025*WT -	.042*SIT	HT +	18.65		1.08
SAGITTAL CURVATURE	.327	.010*WT +	.121*SIT	HT +	23.16		1.41
BITRAGION-CORONAL	.319	.021*WT +	.050*SIT	HT +	26.97		1.33
BIOCULAR BREADTH	.234	.007*WT +	.001*SIT	HT +	8.70		.48
BIAURICULAR BRDTH	.227	.010*WT +	.024*SIT	HT +	12.51		.93
BITRAGION BREADTH	.392	.012*WT +	.003*SIT	HT +	11.10		.46
BIZYGOMATIC BRDTH	.359	.013*WT -	.005*SIT	HT +	11.67		.54
BIGONIAL BREADTH	.349	.013*WT -	.008*SIT	HT +	9.22		.53
NASAL BREADTH	.164	.003*WT -	.014*SIT	HT +	4.01		.33
LIP LENGTH	.098	.003*WT -	.007*SIT	HT +	4.60		.42
MENTON-SUBNASALE L	.219	.005*WT +	.011*SIT	HT +	3.96		.50
MENTON-SELLION LTH	.298	.007*WT +	.030*SIT	HT +	7.17		.58
SUBNASALE-SELLION	.209	.002*WT +	.019*SIT	HT +	2.67		.40
EAR LENGTH	.203	.007*WT +	.006*SIT	HT +	3.83		.43
EAR BREADTH	.139	.003*WT +0	.000*SIT	HT +	2.60		.33
GRIP STRENGTH	.372	.236*WT +	.405*SIT	HT +	1.19		11.67
STATURE REPORTED	.788	.004*WT +	.049*SIT	HT +	1.77		.15
WEIGHT REPORTED	.964	.091*WT +	.019*SIT	HT -	.67		.42

*WEIGHT IN LBS   SITTING HEIGHT IN CM

TABLE 34

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND SITTING HEIGHT* 1977 ARMY WOMEN

VARIABLE	R		SE EST
WEIGHT	1.000	1.000*WT +0.000*SIT HT + 0.00	0.00
STATURE	.801	.086*WT +1.199*SIT HT + 49.58	3.90
SHOULDER HEIGHT	.756	.103*WT + .931*SIT HT + 40.66	3.92
AXILLA HEIGHT	.731	.081*WT + .894*SIT HT + 37.34	3.81
BUSTPOINT HEIGHT	.674	.067*WT + .852*SIT HT + 36.95	4.16
WAIST HEIGHT	.608	.064*WT + .681*SIT HT + 34.99	4.13
CROTCH HEIGHT	.468	.064*WT + .336*SIT HT + 39.32	3.87
BUTTOCK HEIGHT	.519	.095*WT + .278*SIT HT + 47.58	3.99
KNEECAP HEIGHT	.502	.041*WT + .222*SIT HT + 23.59	2.29
CALF HEIGHT	.437	.043*WT + .094*SIT HT + 18.87	2.07
SITTING HEIGHT	1.000	0.000*WT +1.000*SIT HT + 0.00	0.00
EYE HEIGHT/SIT	.965	0.000*WT + .934*SIT HT - 5.82	.91
SHOULDER-ELBOW L	.551	.030*WT + .157*SIT HT + 16.24	1.46
ELBOW-FINGERTIP	.473	.045*WT + .108*SIT HT + 20.38	2.01
KNEE HEIGHT/SIT	.592	.059*WT + .191*SIT HT + 26.94	2.16
POPLITEAL HEIGHT	.483	.033*WT + .200*SIT HT + 20.31	2.06
BUTTOCK-KNEE LGTH	.719	.113*WT + .054*SIT HT + 38.71	2.13
BUST DEPTH	.770	.097*WT - .137*SIT HT + 21.75	1.42
WAIST DEPTH	.781	.099*WT - .196*SIT HT + 21.87	1.38
CHEST BREADTH	.792	.081*WT - .062*SIT HT + 22.81	1.13
WAIST BREADTH	.763	.105*WT - .122*SIT HT + 22.08	1.59
HIP BREADTH	.808	.099*WT + .055*SIT HT + 17.60	1.46
SHOULDER BREADTH	.821	.098*WT - .034*SIT HT + 31.98	1.28
NECK CIRCUMFERENCE	.660	.055*WT + .002*SIT HT + 24.92	1.19
SHOULDER CIRCUMFER	.846	.253*WT - .177*SIT HT + 82.00	2.91
CHEST CIRC AT SCYE	.841	.242*WT - .208*SIT HT + 71.25	2.81
BUST CIRCUMFERENCE	.831	.299*WT - .324*SIT HT + 76.25	2.57
CHEST C BELOW BUST	.815	.225*WT - .162*SIT HT + 58.85	2.91
WAIST CIRCUMFERENC	.827	.324*WT - .479*SIT HT + 68.93	3.88
HIP CIRCUMFERENCE	.906	.301*WT + .010*SIT HT + 54.87	2.71
VERTICAL TRUNK CIR	.907	.234*WT + .915*SIT HT + 45.06	3.06
ARM CIRC AT SCYE	.825	.107*WT - .038*SIT HT + 26.61	1.37
BICEPS CIRC, FLXD	.843	.109*WT - .134*SIT HT + 23.86	1.23
ELBOW CIRC FLXD	.669	.055*WT + .019*SIT HT + 17.09	1.21
FOREARM CIRC, FLXD	.791	.066*WT - .043*SIT HT + 19.56	.94

*WEIGHT IN LBS SITTING HEIGHT IN CM

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TABLE 34 (cont'd)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND SITTING HEIGHT* 1977 ARMY WOMEN

VARIABLE	R		SE EST
WRIST CIRCUMFERENC	.665	.022*WT + .021*SIT HT + 10.01	.51
UPPER THIGH CIRCUM	.895	.227*WT - .194*SIT HT + 43.41	2.05
KNEE CIRCUMFERENCE	.823	.098*WT - .005*SIT HT + 22.30	1.29
CALF CIRCUMFERENCE	.782	.104*WT - .024*SIT HT + 23.38	1.56
ANKLE CIRCUMFERENC	.654	.038*WT + .052*SIT HT + 11.29	.94
SHOULDER LENGTH	.332	.009*WT + .069*SIT HT + 7.94	1.00
INTERSCYE BACK	.489	.060*WT + .007*SIT HT + 29.33	2.05
INTERSCYE FRONT	.577	.051*WT + .023*SIT HT + 24.47	1.43
BACK ARC, BUST	.771	.137*WT - .141*SIT HT + 35.85	2.02
BACK ARC, WAIST	.796	.157*WT - .214*SIT HT + 32.75	2.11
BACK ARC, HIP	.798	.160*WT - .055*SIT HT + 31.03	2.25
WAIST BACK	.547	.016*WT + .360*SIT HT + 8.11	2.22
WAIST FRONT	.482	.039*WT + .210*SIT HT + 13.71	2.30
NECK-BUSTPOINT LGT	.573	.060*WT + .031*SIT HT + 14.71	1.71
AXILLA-WAIST LEVEL	.333	.004*WT + .224*SIT HT + 3.51	2.37
SLEEVE INSEAM	.403	.035*WT + .158*SIT HT + 26.98	2.39
SLEEVE OUTSEAM	.486	.050*WT + .209*SIT HT + 29.40	2.59
CROTCH LENGTH	.677	.150*WT + .394*SIT HT + 19.58	4.02
HEAD CIRCUMFERENCE	.411	.032*WT + .037*SIT HT + 47.55	1.49
HEAD BREADTH	.320	.009*WT + .004*SIT HT + 13.08	.51
HEAD LENGTH	.346	.009*WT + .029*SIT HT + 15.05	.63
PALM LENGTH	.379	.007*WT + .029*SIT HT + 6.49	.48
HAND BREADTH	.506	.010*WT + .007*SIT HT + 5.90	.33
HAND CIRCUMFERENCE	.534	.022*WT + .021*SIT HT + 13.75	.72
HAND LENGTH	.424	.015*WT + .043*SIT HT + 11.80	.82
INSTEP LENGTH	.522	.023*WT + .042*SIT HT + 11.24	.84
FOOT LENGTH	.546	.028*WT + .072*SIT HT + 14.49	1.05
HEEL-ANKLE CIRCUMF	.645	.045*WT + .041*SIT HT + 21.35	1.11
FOOT BREADTH	.504	.012*WT + .017*SIT HT + 5.83	.44
HEEL BREADTH	.517	.012*WT - .019*SIT HT + 6.12	.35
FOOT CIRCUMFERENCE	.595	.032*WT + .034*SIT HT + 15.49	.92
INSTEP CIRCUMFEREM	.590	.039*WT - .005*SIT HT + 18.75	1.02
ANKLE HEIGHT	.264	.004*WT + .064*SIT HT + 4.88	.98
SPHYRION HEIGHT	.411	.002*WT + .057*SIT HT + 1.35	.49

*WEIGHT IN LBS SITTING HEIGHT IN CM

TABLE 35

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND SITTING HEIGHT*
COMBINED WOMEN

VARIABLE	R				SE EST
WEIGHT	1.000	1.000*WT	+0.000*SIT HT +	0.00	.00
STATURE	.806	.086*WT	+1.241*SIT HT +	45.39	3.69
SHOULDER HEIGHT	.753	.106*WT	+ .944*SIT HT +	38.24	3.79
BUSTPOINT HEIGHT	.682	.064*WT	+ .906*SIT HT +	32.69	3.94
WAIST HEIGHT	.627	.076*WT	+ .651*SIT HT +	35.34	3.76
CROTCH HEIGHT	.494	.076*WT	+ .341*SIT HT +	36.34	3.72
BUTTOCK HEIGHT	.534	.096*WT	+ .325*SIT HT +	42.72	3.76
SITTING HEIGHT	1.000	0.000*WT	+1.000*SIT HT +	0.00	.00
EYE HEIGHT SIT	.943	.002*WT	+ .904*SIT HT -	3.77	1.07
POPITEAL HEIGHT	.464	.033*WT	+ .168*SIT HT +	22.70	1.86
BUTTOCK-KNEE LTH	.713	.107*WT	+ .078*SIT HT +	37.12	1.98
BUST DEPTH	.719	.092*WT	- .104*SIT HT +	20.34	1.45
WAIST DEPTH	.770	.096*WT	- .178*SIT HT +	20.34	1.27
CHEST BREADTH	.736	.082*WT	- .049*SIT HT +	21.69	1.27
WAIST BREADTH	.764	.106*WT	- .119*SIT HT +	21.19	1.46
HIP BREADTH	.787	.161*WT	+ .031*SIT HT +	19.44	1.43
SHOULDER BRDTH	.802	.107*WT	- .052*SIT HT +	32.56	1.36
SHOULDER CIRC	.831	.257*WT	- .148*SIT HT +	79.84	2.91
CHEST CIRC AT SCYE	.824	.251*WT	- .210*SIT HT +	70.29	2.86
BUST CIRC	.786	.286*WT	- .259*SIT HT +	74.28	3.72
CHEST CIRC	.801	.235*WT	- .180*SIT HT +	59.54	2.94
WAIST CIRC	.831	.326*WT	- .471*SIT HT +	66.88	3.52
HIP (BUTTOCH) CIRC	.892	.309*WT	- .028*SIT HT +	57.99	2.75
VERT TRUNK CIRC	.883	.233*WT	+ .347*SIT HT +	43.23	3.30
ARM SCYE CIRC	.797	.108*WT	- .033*SIT HT +	26.14	1.41
BICIPS CIRC,FLXD	.828	.117*WT	- .149*SIT HT +	24.44	1.29
FOREARM CIRC,FLXD	.755	.068*WT	- .030*SIT HT +	18.61	1.01
WRIST CIRC	.628	.021*WT	+ .036*SIT HT +	9.07	.55
UPPER THIGH CIRC	.875	.234*WT	- .223*SIT HT +	44.89	2.14
CALF CIRC	.770	.108*WT	- .046*SIT HT +	24.51	1.53
ANKLE CIRC	.601	.037*WT	+ .063*SIT HT +	10.78	1.03
SHOULDER LTH	.331	.011*WT	+ .064*SIT HT +	7.91	.99
WAIST BACK	.666	.123*WT	- .189*SIT HT +	33.78	2.30
BACK CURV AT BUST	.592	.009*WT	+ .402*SIT HT +	5.16	1.94
NECK-BUSTPOINT LT	.561	.060*WT	+ .033*SIT HT +	14.84	1.63

*WEIGHT IN LBS SITTING HEIGHT IN CM

TABLE 35 (cont'd)

MULTIPLE REGRESSION EQUATIONS FOR PREDICTING WOMEN'S
ANTHROPOMETRIC DIMENSIONS FROM BODY WEIGHT AND SITTING HEIGHT*
COMBINED WOMEN

VARIABLE	R			SE EST
SLEEVE INSEAM	.397	.033*WT + .180*SIT HT + 24.88		2.33
HEAD BREADTH	.306	.010*WT +0.060*SIT HT + 13.26		.55
HEAD LENGTH	.345	.011*WT + .026*SIT HT + 14.89		.65
HAND BREADTH	.472	.010*WT + .007*SIT HT + 5.77		.36
HAND CIRC	.520	.024*WT + .024*SIT HT + 13.22		.76
HAND LENGTH	.390	.010*WT + .090*SIT HT + 9.02		.96
FOOT LENGTH	.570	.027*WT + .092*SIT HT + 12.83		.97
FOOT BREADTH	.446	.011*WT + .017*SIT HT + 6.00		.45
ANKLE HEIGHT	.235	.003*WT + .077*SIT HT + 4.09		1.20

*WEIGHT IN LBS   SITTING HEIGHT IN CM

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